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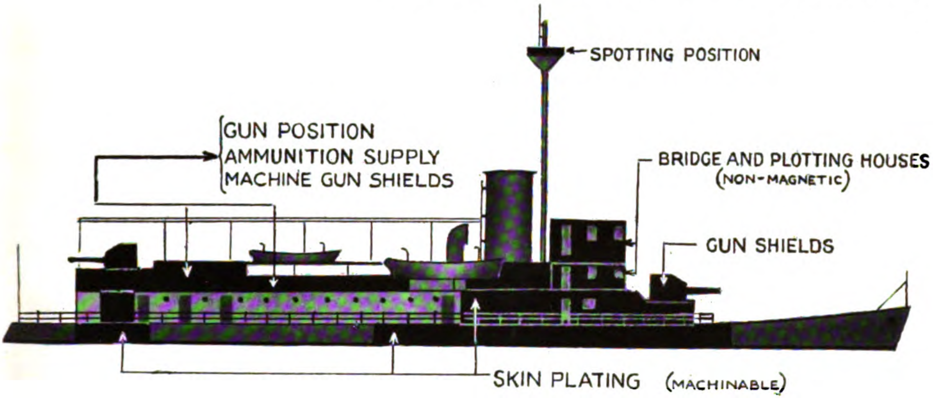

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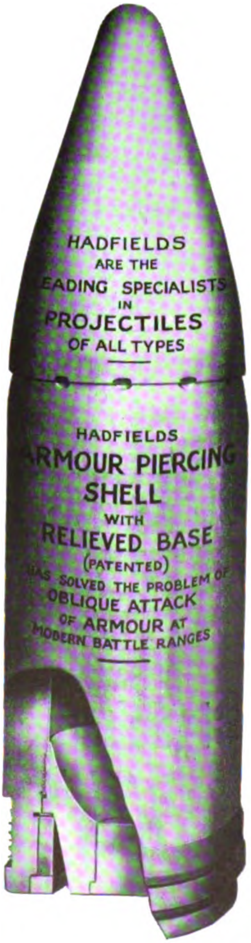

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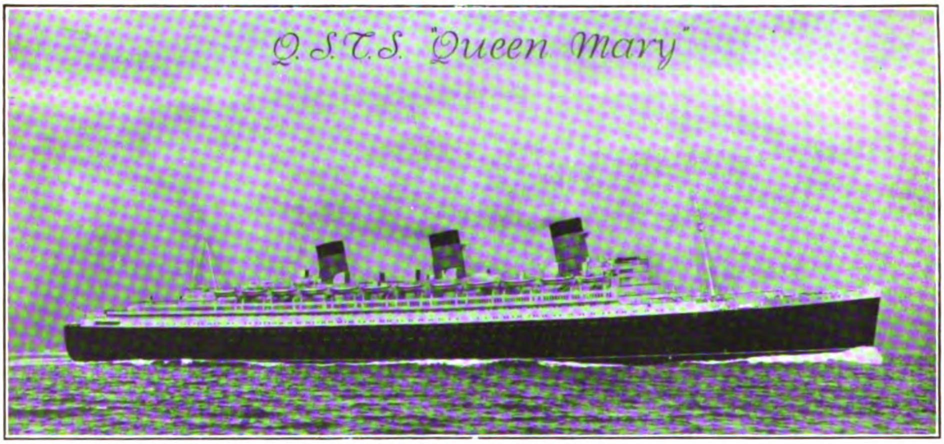

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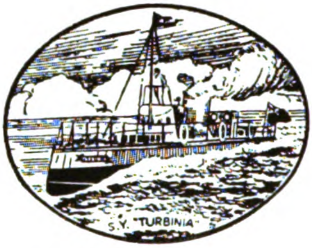

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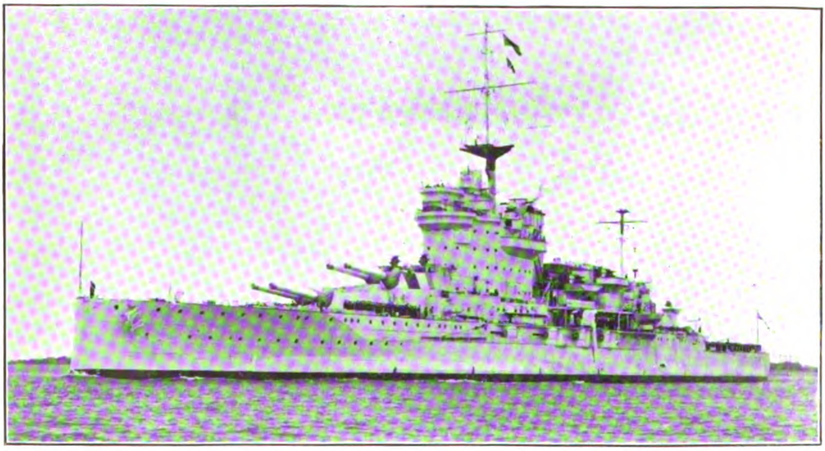

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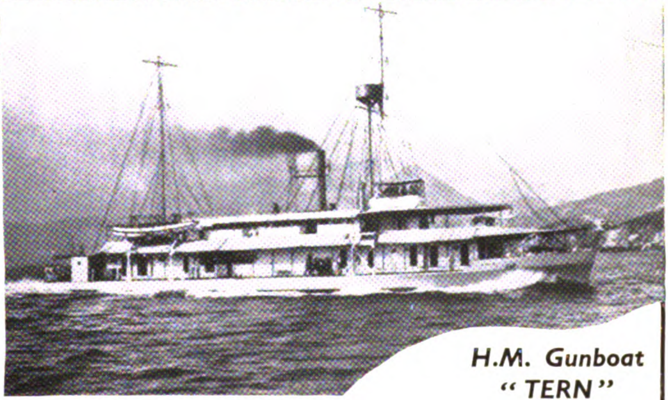

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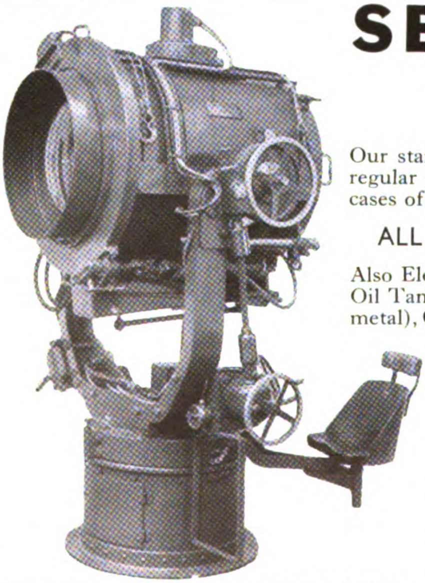

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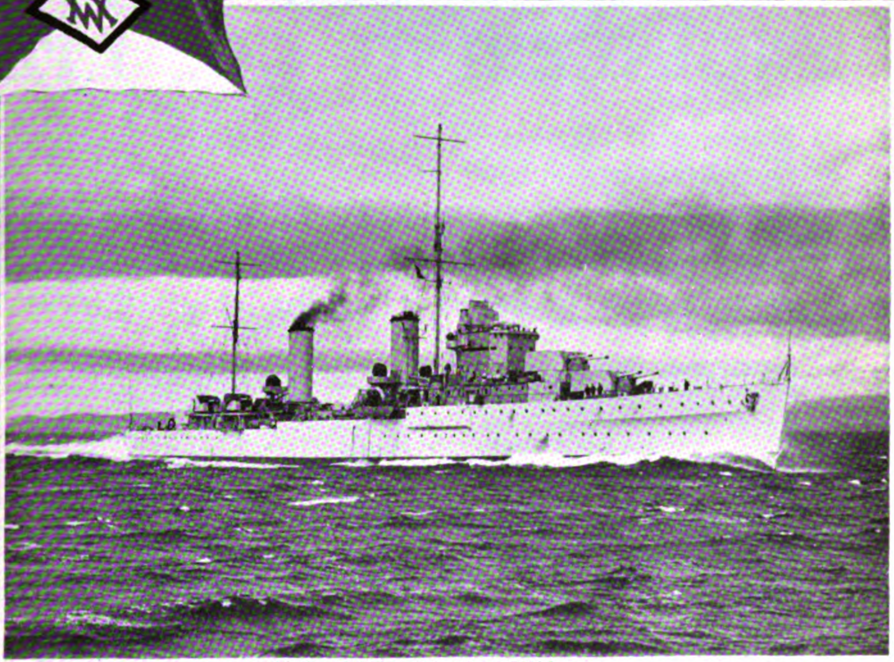

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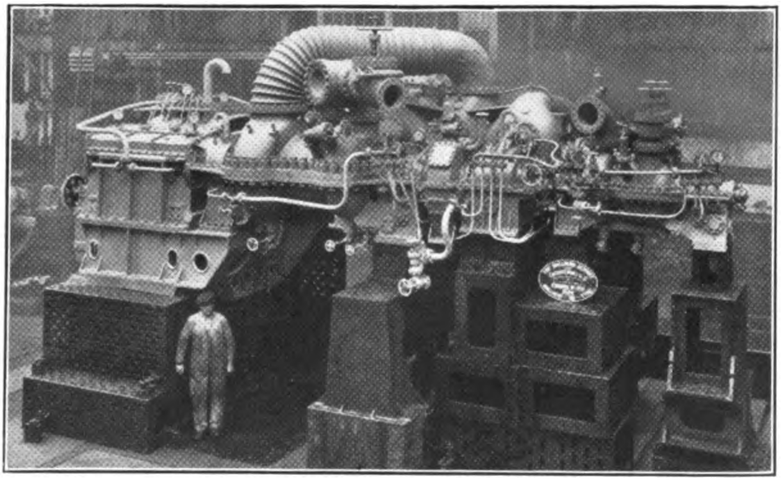

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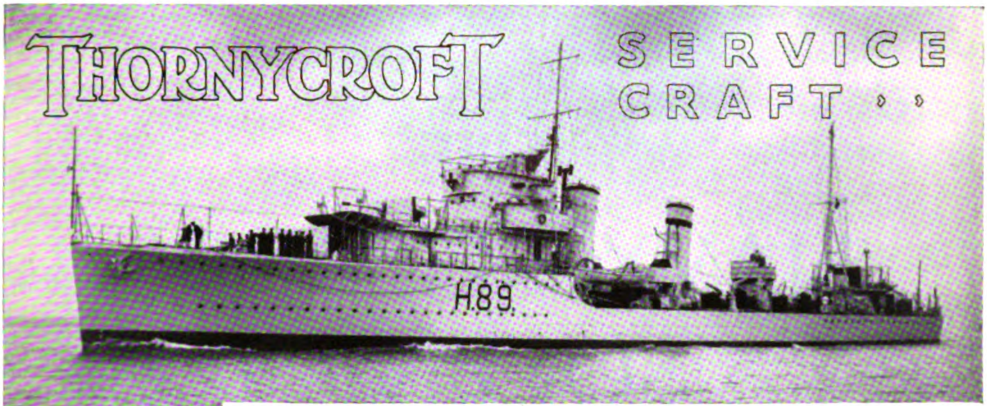

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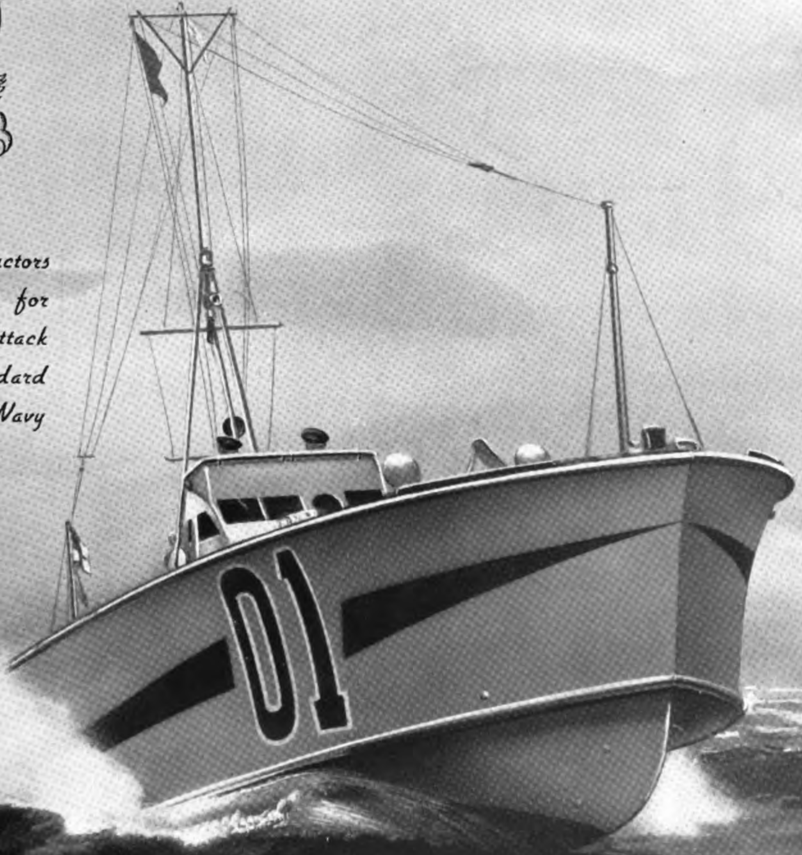

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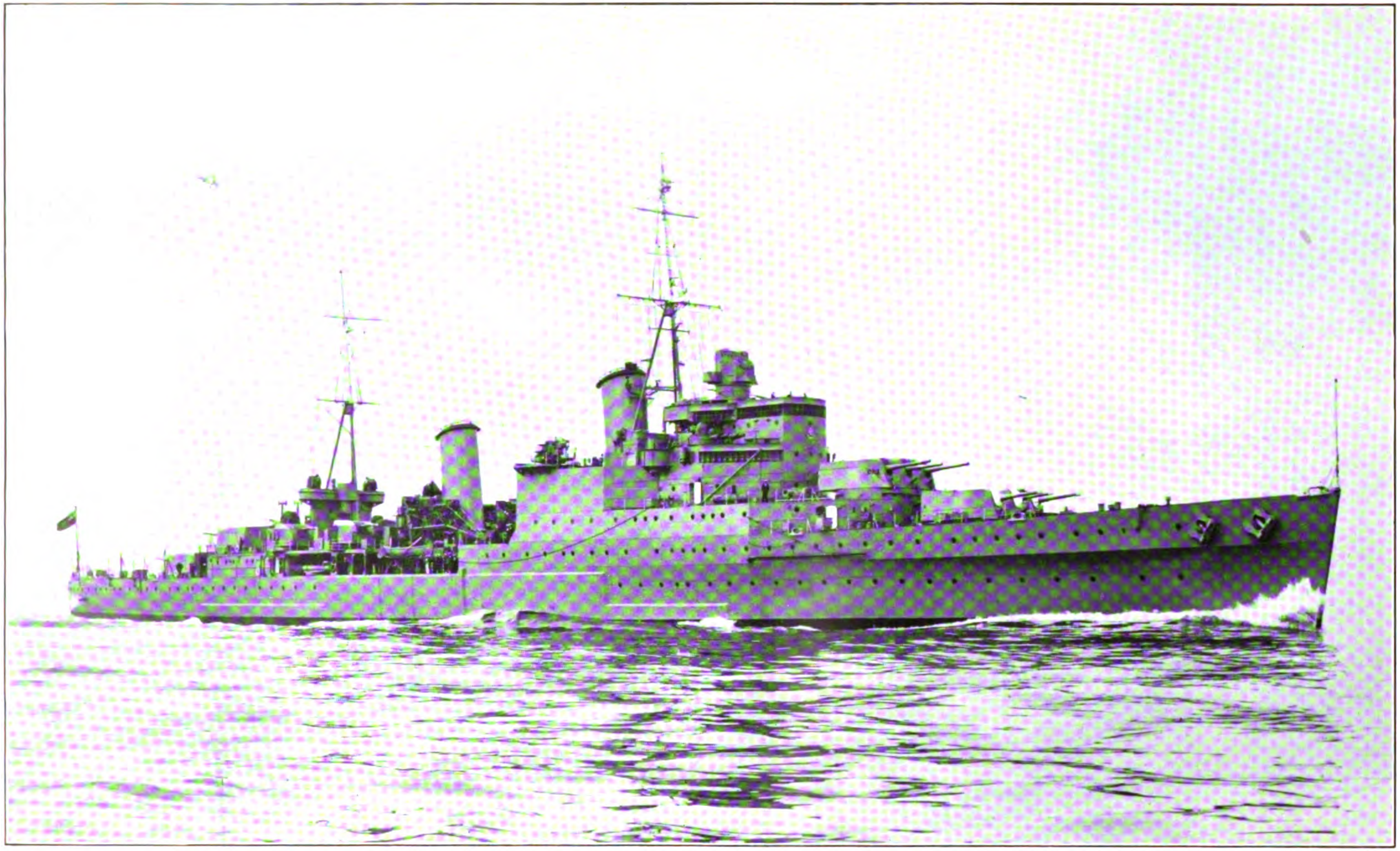

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CONTENTS.

PAGE
PREFACE vii

INTRODUCTORY: THE PROGRESS OF REARMAMENT
Rear-Admiral H. G. Thursfield ix

NAVAL SECTION.

CHAPTER I.
NAVAL EVENTS OF 1937 .. .. *Rear-Admiral H. G. Thursfield* 3

CHAPTER II.
FOREIGN NAVIES .. .. .. *Captain E. Altham, C.B., R.N.* 24

CHAPTER III.
RELATIVE NAVAL STRENGTH
I. QUANTITATIVE .. .. *G. H. Hurford* 50
II. A QUALITATIVE EXAMINATION *Commander Russell Grenfell, R.N.* 60

CHAPTER IV.
NEUTRALITY OR NON-INTERVENTION *Captain A. C. Dewar, O.B.E., R.N.* 69

CHAPTER V.
THE ROYAL ITALIAN NAVY .. *Rear-Admiral Luigi Sansonetti, R.I.N.* 78

CHAPTER VI.
LOWER DECK TO QUARTER DECK, 1818–1937 .. .. "*Historicus*" 87

CHAPTER VII.
NAVAL SIGNALLING .. .. .. *Captain J. W. S. Dorling, R.N.* 106

CHAPTER VIII.
MEN OF THE MERCHANT NAVY *Captain H. Taprell Dorling, D.S.O., R.N.*
("*Taffrail*") 119

NAVAL AIR SECTION.

CHAPTER IX.
BRITISH NAVAL AIR PROGRESS .. *Rear-Admiral H. G. Thursfield* 137

CHAPTER X.
FOREIGN FLEET AIR ARMS .. .. "*Vigilance*" 153

CHAPTER XI.
NAVAL AIRCRAFT PRODUCTION .. .. .. *E. Colston Shepherd* 166

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CHAPTER XII. PAGE

The Influence of "Air" upon Life in the Navy .. "*Volage*" 173

CHAPTER XIII.

Influence of Air Power upon Control of Sea Communications "*Securus*" 181

CHAPTER XIV.

Expansion of Naval Air Forces .. .. "*Observer*" 188

CHAPTER XV.

The Trans-Atlantic Air Service
Lieutenant-Colonel H. Burchall, D.S.O., General Manager, Imperial Airways 198

REFERENCE SECTION.

Dimensions and Particulars of British and Foreign Warships 217–258
Ships of the Lesser Navies 259–266
British and Foreign Flotillas 267–295
Tables of Comparative Naval Strength 299–304
British and Foreign Aircraft Types 307–314
British and Foreign Ordnance Tables 317–337
  Guns and Mountings of British Manufacture 317–324
  Ballistics of Guns of Various Powers 325–337
Miscellaneous 339–400
  The Nyon Agreement (Submarines) 341
  The Supplementary Nyon Agreement (Ships and Aircraft) .. 346
  The Anglo-German Naval Agreement of 1937 and Annexed Documents 348
  The Anglo-Russian Naval Agreement of 1937 358
  The White Paper on Defence (Cmd. 5682) 365
  Statement to Accompany Navy Estimates, 1938 374
    Notes on Matters of General Interest 375
  Abstract of Navy Estimates, 1938 390
  List of British Shipbuilding Firms 398
  List of British Boatbuilders doing Naval Work 399
  List of British Manufacturers of Service Aircraft 400
Profiles of British and Foreign Warships P3–P25
  Capital Ships P3–P8
  Aircraft and Seaplane Carriers and Tenders P9–P11
  Cruisers and Coast Defence Ships P12–P22
  Flotilla Leaders and Destroyers P23–P25
Plans of British and Foreign Warships P29–P121

General Index .. .. } *at end of Volume.*
Index to Profiles and Plans of Warships .. }

LIST OF ILLUSTRATIONS.

H.M. Cruiser *Sheffield*. Constructed at the High Walker Yard of Vickers-Armstrongs Limited, Newcastle-on-Tyne .. .. *Frontispiece*
H.M. Cruiser *Aurora* .. .. *facing page* 6
H.M. Netlayer *Protector* .. .. ,, ,, 14
The French Battle-Cruiser *Dunkerque* .. .. .. ,, ,, 24
The French Cruiser *Marseillaise* .. .. ,, ,, 32
The Argentine Training Cruiser *La Argentina* .. .. ,, ,, 40
The Netherlands Submarine O.16 .. .. ,, ,, 48
The United States Aircraft Carrier *Yorktown* .. .. ,, ,, 56
H.M. Battleship *Warspite*, After Reconstruction .. .. ,, ,, 64
The German Motor Patrol Boat R.17 .. ..
German Submarines Alongside the Tender *Saar* .. .. } ,, ,, 72
H.M. Flotilla Leader *Inglefield* .. .. ,, ,, 80
Engines and Boilers for the Argentine Cruiser *La Argentina* ,, ,, 88
The United States Cruiser *Vincennes* .. .. ,, ,, 96
British Motor Torpedo Boats of the 1st M.T.B. Flotilla .. ,, ,, 104
H.M. Patrol Vessel *Sheldrake* .. ..
35-Foot Ship's Motor-Boat .. .. } ,, ,, 112
H.M. Destroyer *Imogen* .. .. ,, ,, 120
H.M. Submarine *Rorqual* .. .. ,, ,, 128
The Vickers-Supermarine " Stranraer " Flying-Boat .. ,, ,, 137
The Fairey " Seafox " Light Reconnaissance Seaplane ..
The Vickers-Supermarine " Walrus " Amphibian Flying-Boat .. .. } ,, ,, 144
The United States Cruiser *Philadelphia* .. .. ..
The United States Submarine *Pompano* .. .. .. } ,, ,, 153
The Polish Destroyer *Grom* .. .. ,, ,, 160
The Blackburn " Skua " Dive-Bomber-Fighter .. .. ,, ,, 168
Fairey " Swordfish " Torpedo-Spotter-Reconnaissance Aircraft and H.M.S. Glorious .. .. } ,, ,, 176
The German Cruiser *Nurnberg* .. ..
A German Destroyer, " Z " Type .. .. } ,, ,, 184
The Vickers-Supermarine " Walrus " Amphibian Flying-Boat .. .. ,, ,, 191
The Imperial Airways Flying-Boat " Caledonia " .. ..
The Pan-American Airways Flying-Boat " Clipper III " .. } ,, ,, 198
The Imperial Airways Flying-Boat " Caledonia " .. ..
The Mayo Composite Aircraft .. .. } ,, ,, 208

PREFACE.

For convenience of reference, "Brassey's Naval Annual" contains the Navy Estimates for the current year and is published as soon as possible after they are available—i.e. in April. In order to make this possible, however, the bulk of the book has to be in type early in the New Year and therefore refers to the events of 1937 only; the Introductory Chapter brings the record up to date as far as the British Navy is concerned.

In the Naval Section, readers will note the names of regular contributors of former years. Captain Altham once more describes the progress of foreign Navies. Captain A. C. Dewar, whose qualifications as a historian and an authority on naval lore are indisputable, writes on the policy of "Non-Intervention," which the peculiar circumstances of the Spanish civil war have brought into being as a new concept in international law. The view of this matter which he presents with all his usual incisive force will not, perhaps, be shared by all observers of the political developments of to-day. Mr. Hurford again writes on relative naval strengths, treating the subject, as usual, from the quantitative point of view. There are, however, other respects in which the strength of navies can be compared; one of these is qualitative, a comparison of the material fighting power of ships of similar classes in different navies. Commander Russell Grenfell contributes a carefully thought-out comparison on this basis to supplement the result of Mr. Hurford's survey. I have been fortunate in securing a contribution from Rear-Admiral Sansonnetti describing the recent progress and present state of the Royal Italian Navy.

In the British Navy, attention has been directed in the last year to the progress of the Admiralty's plan for providing opportunity, for those men of the lower deck who show the necessary ability and character, to rise to commissioned rank and to command; "Historicus" reviews the development of these arrangements throughout the last quarter of a century. Captain J. W. Dorling, a former captain of the Signal School at Portsmouth, contributes a history of the development of signalling in the Navy; and Captain H. T. Dorling (well-known to readers of books on the sea under his pen-name of "Taffrail") a plea for the better organisation of the personnel of the sister sea service, the Merchant Navy. Few Englishmen will be at variance with "Taffrail's" insistence upon the national importance of the British Merchant Navy, or with his view that its condition to-day is in sore need of improvement; though there may not be so great a measure of agreement on the merits or practicability of the particular manning plan which he outlines.

In the Naval Air Section, besides my own review of the year's events, "Vigilance" again describes the progress of foreign fleet air arms and Mr. Shepherd describes the process of the production of naval aircraft—an important subject in these days of rapid expansion in the Fleet Air Arm and of change in the organisation under which it works. Three chapters follow, by authors who prefer to write under pen-names, one of which will be familiar to readers of "Brassey's" in former years, on different aspects or consequences of the development of the Air Arm. "Volage" surveys its influence on life and work in the Navy: "Securus" discusses its influence on the traditional task of the control of sea communications; and "Observer" traces its growth in the British Navy in the last twenty years. Finally, Lieutenant-Colonel Burchall, the well-known General Manager of Imperial Airways, who last year outlined the problems facing those whose task it is to provide a Trans-Atlantic Air Service, this year describes the very considerable progress made towards their solution.

By permission of the Director of Naval Construction, to whom my thanks are due, Mr. M. C. Dunstan has taken over from Mr. S. H. Watson the revision of the Tables, Profiles, and Plans in the Reference Section. The information contained in these is based on the latest figures that have appeared in various publications, and it is believed to be accurate, even though not yet confirmed by official announcement. I am much indebted to the Naval Attachés in London of America, Argentina, France, Italy, Japan, and the Netherlands for their help and courtesy in replying to my queries and in supplying me with information for which I asked. Once more I desire to acknowledge gratefully the valuable assistance rendered to me in many ways by Mr. G. H. Hurford.

H. G. Thursfield.

INTRODUCTION.

THE PROGRESS OF REARMAMENT.

THE NAVAL TREATIES IN OPERATION.

THERE has been no change in the policy adopted three years ago, of restoring the Defence Services to the standard set by the demands of Imperial security. The naval measures necessitated by that policy have, however, been governed to some extent by the course of international affairs. The extension of the 1936 Naval Treaty system to include both Germany and Soviet Russia, described elsewhere in this volume, was achieved in 1937 ; but Japan still stands outside the system, and is thus neither subject to any limitations on the size of the ships-of-war she may build, or the guns they may mount, nor under any obligation to inform other Powers what she is doing in that respect. When, therefore, persistent rumours began to be heard towards the end of 1937 and afterwards that she was constructing ships exceeding the limits by which the Treaty Powers are bound, those Powers were placed in a somewhat difficult position.

If the rumours were well-founded the departure from Treaty limits might take one of two forms, either in respect of battleships or of cruisers. Battleships might be under construction mounting guns exceeding 16-inch, in which case they would certainly be of tonnage greater than the 35,000 of the Treaty, or they might be of tonnage greater than 35,000, though still only mounting 16-inch or smaller guns. In either case, they would be more powerful than the corresponding ships which could be built by the Treaty Powers ; for the latter, being subject to the tonnage limit, must perforce forgo many features making for fighting power which the unlimited ship could embody without difficulty.

Alternatively, cruisers might be under construction which exceeded the 10,000-ton, 8-inch-gun, limits of the Treaty, though not reaching the dimensions—and therefore great cost—of the capital ship ; ships, in fact, falling within the " non-construction zone " of the Treaty. Such ships would present a difficult problem to those Powers which have a great sea-borne trade or extensive sea communications to defend.

If either of these courses of action was actually being pursued by Japan, the Treaty Powers would need to take the steps provided in the Treaty to cope with such a situation. They would certainly desire to match any increase in the size and power of Japanese battleships ; and if the defence of their convoys were threatened by the appearance of heavy cruisers—as, for instance, of 12,000 tons, armed with 9·2-inch guns—they would certainly desire to abrogate the " non-construction zone," sufficiently to provide themselves with similar ships. But they had no desire lightly to discard the provisions for limitation which they had been at such trouble to negotiate and were reluctant to do so unless the necessity for that action were clearly established. That was not the case, since the Japanese Government had given no information abroad of what they were doing in the matter of naval construction, and nothing was known of it outside Japan. There was thus no definite information upon which the Treaty Powers could invoke the " escalator " clauses.

NOTES TO JAPAN.

Consequently, on February 5, 1938, notes were handed to the Japanese Government from the British and American Governments, followed a day or two later by one from France, in practically identical terms. They drew the attention of Japan to the terms of the London Naval Treaty—of which Japan was officially cognisant, since she had observers at the Conference after her delegation withdrew from it—and mentioned that rumours had reached them to the effect that Japanese ships exceeding Treaty limits were under construction. They informed Japan that, " in the absence of explicit assurance from the Japanese Government that they are ill founded," these rumours would be deemed to be authentic, and that the Treaty Powers would thereupon " exercise their right of escalation " and resume full liberty of action. At the same time they expressed their willingness to discuss any limits of tonnage and gun-calibre, other than those of the Treaty, which commended themselves to Japan. They asked for an answer in a fortnight.

The Japanese reply was received in a week. It did little to resolve the difficulties of the Treaty Powers, since although it contained a statement that " the Japanese Government have no intention whatever of possessing armaments which would menace other countries," it blandly declined either to deny the rumours to which reference had been made, or to give any information whatever regarding Japanese new construction. It also restated the Japanese attachment to the principle of quantitative limitation—by which was meant, it was indicated, the " common upper limit " propounded at the Naval Conference in 1935—and conveyed a refusal to discuss any form of naval limitation which did not embody it. It was declared not to be " a matter which should concern this Government if your Government, on the basis of whatever reason or rumour, should exercise the right of escalation provided in any treaty to which Japan is not a party." Though the latter pronouncement was contradicted in an official statement, issued in Tokyo at the same time that the reply was published, which contained the following passage. " Japan would regret it profoundly if these powers (i.e. *Great Britain and the United States*) should undertake still more extensive armament construction on such grounds (i.e. *Japan's refusal to contradict the rumours of her building ships which exceed Treaty limits*), thereby leaving Japan no alternative but to alter her building plans in order to cope with that construction."

The approach to Japan had thus contributed nothing towards the solution of difficulties of the Treaty Powers. In accordance with Article 25 of the Treaty, if any non-Treaty Power authorises or builds a man-of-war exceeding Treaty limits the Treaty Powers shall consult amongst themselves the extent to which they shall relax their own restrictions; and three months after the consultation is first summoned the restrictions are removed, either in whole or in part according to the degree of agreement achieved. Article 26 of the Treaty prescribes the same procedure in the event of any unspecified change of circumstances which, in the opinion of any Treaty Power, calls for a relaxation of Treaty limits. Accordingly, a meeting of the naval experts of the three Treaty Powers took place in London on March 1; but as it was officially described as "informal," presumably it was not the meeting which, under Article 25 or 26, would set the procedure for "escalation" in motion.

The conditions in which Article 25 can be invoked are not yet present, so that any formal consultation must presumably be inaugurated under Article 26. It would seem probable that the meeting of experts on March 1 was for the purpose rather of discussing whether the situation was such as to call for escalation, and if so, in what respect than of formally inaugurating the process. There the matter rests at the time of writing; and uncertainty surrounding the future size and armaments of new ships was reflected in the form in which the year's Estimates were later presented.

THE DEFENCE WHITE PAPER.

Following the precedent of the last three years, a White Paper dealing with Defence as a whole was issued on March 2, before the Service Estimates. It differed from its predecessors, which had been largely devoted either to demonstrating the necessity for rearmament or to explaining the proposed method of financing that process, in that it was chiefly a report of progress made. This was, for obvious reasons, in very general terms.

Progress with rearmament was pronounced to have been on the whole satisfactory, despite certain set-backs arising from the difficulty of satisfying the increased demand for certain special materials and for certain types of skilled labour. Some new factories were already in production; existing factories were working up to capacity. Most of the difficulties had been met and the rate of production was increasing.

The White Paper then dealt with each of the Services.

THE NAVY.

The progress of rearmament was illustrated by the steady growth in tonnage of ships building, for which the figures were given for January 1 in each of the past four years. The building programme for the current year would be—

2 Capital ships.
1 Aircraft carrier.
4 Large cruisers.
3 Small cruisers.

3 Submarines.
3 Minelayers.
2 River gunboats.
1 Destroyer depot ship.
1 Submarine depot ship.
1 Fleet Air Arm supply and repair ship.

in addition to an unspecified number of boom defence vessels, tugs, motor torpedo boats and miscellaneous small craft.

Recruiting had been satisfactory in all branches, with the single exception that some difficulty had been experienced in the past year in obtaining the number of skilled tradesmen, owing to the demands for that class of the rearmament programme. But even in that respect matters were improving. During the first three quarters of 1937 over 11,000 recruits had been entered, and a total increase of 10,000 had been planned. For 1938 a further increase of 7,000 was intended.

Plans were being worked out by the Admiralty and Air Ministry for the transfer of the Fleet Air Arm to naval control, the Air Ministry being responsible for the preliminary training of pilots.

THE ARMY.

Mechanisation was proceeding satisfactorily. Most major articles of armament and equipment were already through the stages of design and development, and should come into full production during the current year. Progress was being made also with the provision of modern equipment for the Territorial Army, being lent from the Regular Army, when required, as a temporary measure until full supplies should be available.

Good progress was being made with bringing barracks up to modern standards of accommodation, and with the provision of proper accommodation for the two Anti-Aircraft Divisions. In various other respects the conditions of service had been adjusted and improved, with satisfactory results on recruiting. During 1937, 3,600 more recruits were entered than in the previous year, and up to January, some 2,600 reservists had responded to the invitation to rejoin the Colours.

The development of active ground defence against air attack had been continued, and the strength of the two Anti-Aircraft Divisions had increased by 345 officers and over 9,000 men.

THE AIR FORCE.

Deliveries of machines were proceeding satisfactorily, having been expedited by the omission of the " prototype " stage and by putting new designs straight into production. The number of types of aircraft in service was being progressively reduced, so as to facilitate rapid manufacture. Six shadow factories for engines were already in production ; one for airframes was expected to begin production in a few weeks and the other later in the year ; others for airscrews and carburettors, which were additional to the original programme, were in production.

Fifty-nine new aerodrome sites had been acquired since the start of the expansion programme, of which 30 were already in use by units. Service flying training schools had been increased from four to eleven. Elementary flying training was carried out exclusively at civil flying schools, of which there were thirteen. Armament training camps had been increased from three to seven and more would be opened later.

Since April 1935, some 4,500 candidates for training as pilots had been accepted, and 40,000 for airmen, mostly for training in skilled trades. The R.A.F. Volunteer Reserve was working very satisfactorily and would be still further extended.

During the past year the strength of the metropolitan Air Force was raised from the 52 squadrons of 1934, to 123 squadrons; 68 of these were of bombers, 30 of fighters, 15 of general reconnaissance or torpedo bombers, and 10 Army Co-operation. The balloon barrage scheme had been successfully inaugurated and most of the material delivered. The organisation of the Air Defence was described as follows:—

> The Air Ministry is responsible for the air defence scheme as a whole and the anti-aircraft units of the Territorial Army, which provide the gun and searchlight defences, come directly under the Air Officer Commander-in-Chief, Fighter Command, for operations in war and combined training in peace. Plans are prepared in a joint Committee, the membership of which includes the Anti-Aircraft Divisional Commanders and representatives of the operations branches of the War Office and Air Ministry, the Air Officer Commander-in-Chief, Fighter Command, being Chairman. The latter has on his staff two General Staff Officers from the Army. The Anti-Aircraft Divisional Commanders have their Headquarters with the Commanders of the Fighter Groups in peace. In all operational matters there is direct communication between Headquarters, Fighter Command, and the Anti-Aircraft Divisions.

The White Paper then described the progress of the Air Raid Precautions organisation, under the Home Office, for the civil population. Gas masks for the whole civil population would be available in the course of the current year. Finally, the question of cost was again reviewed, with the conclusion that the cost in 1939 would in all probability exceed the £343¼ millions now estimated for 1938, and the total cost for the five years 1937–41, even if 1939 proved to be the peak year, seemed likely to exceed the £1,500 millions estimated in the 1937 White Paper.

THE NAVY ESTIMATES.

The Navy Estimates were issued on March 4. The total was £123,707,000, £18,622,000 higher than 1937. Of this, £30 millions was to be financed out of loan under the Defence Loans Act, as against £27 millions in 1937, so that the total to be financed out of revenue was £93,707,000, an increase of £15,642,000.

This, however, was not all, since no money was taken in the Estimates for the current year's new construction programme—of which the details were outlined in the White Paper—which was little smaller than that of 1937. This omission was, no doubt, due to the uncertainty regarding the design of the new ships arising out of the Japanese situation, mentioned above. The First Lord's Statement announced that a Supplementary Estimate would be presented later in the year to cover the new construction programme.

The Statement explained that, of the gross increase of £18,642,000, £7,895,375 was due to the heavier payments falling due in this year upon new ships already under construction under former years' programmes. £9,120,925 was due to the increased maintenance costs of the fleet—large items of which were the cost of modernising older ships and a rise in the price of materials. £1,598,000 was due to increased provision for the Fleet Air Arm; and the small balance of £27,700 to an increase in non-effective services. This allocation is of interest since the first two items of it are only discoverable from the Estimates themselves with difficulty; but it is not altogether convincing, for the second item is apparently arrived at by subtracting from the gross increase the figures which are clearly attributable to new construction, the Fleet Air Arm and the non-effective services. By that process, the increase in the estimate for Works—Vote 10, £224,000—for instance, is included in "the provision for maintenance, repair and manning of the Fleet."

The Statement was accompanied by the usual "Notes on Matters of General Interest," consisting of a review of naval affairs during the past year. The chief items of interest in this, other than those mentioned in Chapters I and IX hereafter, were as follows :—

DISTRIBUTION OF THE FLEET.

The Kent is to return to the China Station on completion of large repairs. The Manchester and Liverpool ("Southampton" class) are to join the East Indies Station on completion, replacing the Emerald and Enterprise.

The Submarine Depot Ship Maidstone is to join the Mediterranean Station on completion, replacing the Cyclops in the 1st Submarine Flotilla. The new submarines now building are to join the home flotillas on completion.

PERSONNEL.

The Cornwall has taken the place of the Royal Sovereign as the sea-going training ship for boys in the Home Fleet. One cruiser in the Reserve Fleet at each home port is also being used for this purpose.

Promotion of ratings continues to be rapid. The new scheme for promotion from the lower deck to sub-lieutenant (*vide* Chapter VI) "is developing most satisfactorily." The first class of 31 began their nine months' course of special training in H.M.S. Ramillies on November 8.

The first Review of Service Conditions is now approaching completion; the new system has proved satisfactory, and has enabled the Admiralty to make various improvements in the conditions of service on the lower deck. One particularly mentioned is the substitution of butter for margarine in the daily ration.

NEW CONSTRUCTION.

The Ark Royal, aircraft carrier, is expected to complete in the summer. All cruisers of the 1933 and 1934 programmes are now complete. The three of the 1935 programme, all of the " Southampton " class, should be completed in the current year. Orders for all of the 1937 programme have been placed.

Destroyers of the 1935, 36, and 37 programmes are proceeding satisfactorily, but orders for the last eight of the latter year, the " Laforey " class, have yet to be placed. The first of the " Tribal " class should be delivered shortly.

WORKS.

The chief new item under this heading was the extension of No. 6 Dock at Chatham, in order to enable it to take modern cruisers. This was necessary in order to enable Chatham to take its full share of the repair work of the fleet. Battleships to-day have outgrown the Medway, and in consequence battleships manned from the Chatham Depot, to which they can approach no nearer than Sheerness, have to be refitted elsewhere. Cruisers are now reaching a size which, although they can enter the basins at Chatham, precludes their being docked there, so that the work on them too will be partly thrown on other yards but for the work now being put in hand.

At Plymouth, the Army's gun wharf, which cuts off the North from the South Yard, has at last been taken over by the Navy. At Portsmouth, new workshops are being put in hand in the dockyard, and a permanent building on shore is to be erected to house the mechanical training establishment—which trains apprentices for artificer—at present housed in the old hulk Sultan, now deteriorated past repair at reasonable expense. Work at Gibraltar and Singapore was proceeding according to plan.

MISCELLANEOUS.

Under this heading various items of interest in the sphere of organisation and technical progress were detailed. The chief, perhaps, is the announcement that the purchase of steel for the Royal Dockyards has been centralised in an Admiralty Steel Office at Newcastle-on-Tyne. Delays in delivery had been thereby avoided. Amongst various examples of the advances in engineering which had been achieved, it was mentioned that a high-powered high-speed internal-combustion engine was being developed for use in motor torpedo craft.

THE FLEET AIR ARM TRANSFER.

Two measures for the expansion of the Fleet Air Arm were inaugurated by the Admiralty early in the year. On February 17 the institution of a " Naval Air Branch " was announced, consisting of officers entered for naval air duties only, for a limited period of service. It corresponded to the short service system of officers' commissions in force in the R.A.F.

NAVAL AIR BRANCH.

Commissions were offered, in the first instance, for seven years, to candidates between 17½ and 23, who reached a certain exacting physical standard and held an educational qualification not inferior to school certificate. The first year would be probationary, and training would last two years. Those who entered under 22 would be rated midshipman (A), and promoted to sub-lieutenant (A) at 22, or at any age over 20 at which they completed their training. All would be promoted to lieutenant (A), if recommended, after two years' service as sub-lieutenant. They would be employed on flying duties, afloat or ashore, and would be eligible to command naval air units, though not, of course, sea-going ships. Their pay and flying allowances would be the same as those of the same ranks on the permanent list.

After seven years' service, lieutenants (A) would have the alternatives of either transferring to an " emergency list," with a gratuity of £600, for eight years; or, for those who volunteered and were accepted, of continuing to serve on the active list for full flying duties for another eight years. The former, if they underwent periodical naval training and kept themselves in flying practice would receive a retaining fee of £25 a year. The latter would be eligible for promotion to lieutenant-commander (A) after eight years' service as lieutenant.

At the completion of the second period, lieutenant-commanders (A) would withdraw with a gratuity of £1,600, but a few might be permitted to serve on for a pension at the age of 40, or after 20 years' service. Exceptionally, promotion to commander (A) might be gained.

The periods of service in the Naval Air Branch are thus rather longer than in the short service section of the R.A.F. That, however, was to be expected, since it was the Navy's experience—that three years was the minimum in which a naval airman could become efficient—which was largely the cause of the separation of the Fleet Air Arm from the R.A.F.

LOWER DECK PILOTS.

On March 5 the opening of the ranks of air pilot to ratings in the Navy, as they had long been open to their opposite numbers in the Air Force, was announced by the Admiralty.

Ratings might volunteer between the ages of 21 and 24, provided they had passed the Educational Test, Part 2, and were not below A.B. rate, passed and recommended for leading rate. Those accepted must transfer to the seaman branch and would be employed for 7 years on flying duty. They would be trained for a year on shore, followed by an 8-weeks' cruise in an aircraft carrier; on completion of training, they would be rated Petty Officer.

At the end of the seven years, those who volunteered and were found fit might be retained on flying duties for further 3-year periods, subject to reassessment at the end of each. Others would form a reserve of pilots.

OTHER MEASURES.

Up to the time of writing, no announcement had been made as to the aerodromes which would be transferred to naval control. The matter was still under discussion between the Admiralty and the Air Ministry.

THE INTERNATIONAL SITUATION.

If any demonstration were needed of the necessity for the great efforts now being made in this country for the restoration to full strength of its Defence Services, the course of world events in the last eight months, and particularly in the last few weeks, has amply provided it. In the Far East, a part of the world in which the British Empire has not only great trade interests, but important territorial possessions, relations of the dominant Power with all western Powers and with this country, it would seem, in particular have seriously deteriorated. Events in that part of the world point to the probability that their course in the future will be governed by the principle that might is right. In Europe, British relations with the chief Mediterranean Power have not recovered from the strain put upon them by the events of 1935 and 1936 ; and though improvement is now being sought, it still remains to be seen whether it will be achieved to the extent of the Mediterranean reverting to the status it once occupied, from the British point of view, of an unlikely theatre of hostilities.

In the naval sphere at least, the friendly conclusion of a second Agreement with Germany seemed to indicate the possibility of future co-operation between the British Empire and that Power. But the events of March 1938 in Central Europe point once more to the improbability, in the present temper of nations, that the course of events in the world will be swayed by anything beyond naked force. In such a world, there is nothing for it, even for the most peace-loving of nations, for those most devoted to the principle that law and justice rather than force should rule between nations no less than between individuals, but to see to it that their arms are adequate.

H. G. T.

NAVAL SECTION

CHAPTER I.

NAVAL EVENTS OF 1937.

THE KING AND THE NAVY.

On January 12 His Majesty the King was pleased to assume the title of Master of the Merchant Navy and Fishing Fleets—a position which was created by King George V in 1928.

In February His Majesty granted his patronage to the Royal Navy and Royal Marines Football Association, Rugby Union, and Cricket clubs.

THE CORONATION.

In accordance with precedent, the Navy had a large part in the celebrations of the Coronation. From May 7 to 13 the bulk of the Home Fleet paid a visit to the Thames, ships anchoring or securing at various points between London Bridge and the Nore. In the Port of London was the flotilla leader Exmouth, secured to buoys just opposite the Custom House, and the sloops Fleetwood and Indus —the latter of the Royal Indian Navy—just below Tower Bridge. In St. Katharine's Dock were the submarines Swordfish and Starfish of the 2nd Submarine Flotilla. At East Greenwich was the cruiser Cairo, bearing the broad pendant of Commodore H. D. Pridham-Wippell, C.V.O., Commanding Home Fleet flotillas, and the Encounter, of the 5th Destroyer Flotilla. The remainder of the Flotilla were in pairs lower down, the Echo and Eclipse at Erith Causeway, the Express and Esh at Greenhithe Causeway, the Escort and Electra in Tilbury Docks with the submarines Narwhal and Porpoise. In the river off Gravesend were the new cruisers Southampton, flagship of Rear-Admiral T. F. P. Calvert, C.B., C.V.O., D.S.O., Commanding the 2nd Cruiser Squadron, and Newcastle, the submarine depot-ship Lucia, the netlayer Guardian, and the destroyer Crusader. Off Southend Pier were the destroyers Boadicea, Bulldog, and Stronghold, and between there and the Nore were the Furious, aircraft carrier, and the battleships Nelson, bearing the flag of the Commander-in-Chief, Admiral Sir Roger Backhouse, K.C.V.O., K.C.B., C.M.G., Rodney, Royal Sovereign, Ramillies, and Revenge. It was originally intended that the Royal Oak, flagship of Rear-Admiral C. G. Ramsey, and Resolution should also be present, but their services were still required in North Spanish waters, together with the remainder of the 4th Destroyer Flotilla, of which the Bulldog and Boadicea were the only representatives in the Thames.

The Fleet was officially welcomed on its arrival in the Thames by

Lord Ritchie of Dundee, Chairman of the Port of London Authority. The following day the Lord Mayor, Sir George Broadbridge, paid an official visit to the Commander-in-Chief on board the Nelson. He embarked at Tilbury in H.M.S. Crusader, which hoisted his flag as Admiral of the Port of London, which he is entitled to fly when afloat within the limits of the Port, and in her went down to the Nore and went on board the Nelson. He was entertained to lunch by the Commander-in-Chief, and returned later to Tilbury once more in the Crusader, which steamed round the battlefleet before leaving. The next day Sir Roger Backhouse, accompanied by his staff and by the other flag officers of the Fleet, paid a return visit to the Mansion House. The Fleet was open to visitors throughout the week, and thousands of Londoners availed themselves of the opportunity to inspect it. At night the ships were illuminated and frequent searchlight displays were given.

On the day of the Coronation, as usual, a naval guard of honour was mounted at Buckingham Palace, and the naval detachment occupied senior position of the Services in the procession through London after the ceremony, immediately before the ministerial and Royal sections of the procession. The Lords of the Admiralty rode in the entourage of their Majesties.

The Naval Review at Spithead, a traditional feature of all great national celebrations, took place a week later, on May 20. Three fleets were present; the Home Fleet, still short of the Royal Oak and certain destroyers of the 6th Flotilla on duty in North Spanish waters; the Mediterranean Fleet, less the 2nd destroyer flotilla and the 3rd Cruiser Squadron, which remained on the Station; and the Reserve Fleet. The latter, under the command of Vice-Admiral G. C. Dickens, C.B., C.M.G., was divided into the 9th and 10th Cruiser Squadrons, destroyer flotillas, and miscellaneous craft. Rear-Admiral A. N. Dowding was appointed to command the 10th Cruiser Squadron, temporarily during the review period, with his flag in the Colombo.

In accordance with precedent, foreign navies were invited to send representatives to the Review, and the invitation was accepted by sixteen navies. One of the most notable of the foreign ships present was the American battleship New York, which in 1917–18 had been the flagship of Admiral Hugh Rodman, commanding the detachment of the U.S. Fleet which became the 6th Battle Squadron of the Grand Fleet. Admiral Rodman had been selected as the chief representative of the American Navy at the Coronation, and again flew his flag in the New York. On his arrival in London some weeks before the Review, he was entertained at a private dinner by the survivors of his brother flag-officers of the Grand Fleet. Public interest in the foreign representatives at Spithead, however, was centred more in the new French battle-cruiser Dunkerque and the German armoured ship Graf Spee, neither of which ships had been seen before in British waters. The other foreign ships were nearly all of respectable age. They arrived at varying intervals before the day of the Review, and were boarded by many interested visitors during their stay.

Their Majesties the King and Queen, with Princess Elizabeth and the Duke and Duchess of Kent, arrived at Portsmouth on the afternoon of May 19, entering the city in open cars. They received a civic welcome and a loyal address at the Guildhall before going on board the Royal Yacht in the Dockyard, where they were received by the Commander-in-Chief, Admiral Sir William Fisher, and other flag officers of the Port, who also had the honour of dining with Their Majesties.

On the following morning, Thursday, May 20, His Majesty received on board the Royal Yacht the flag officers of the fleet at Spithead, the representatives of the Dominion Navies present, representatives of the Merchant Navy and Fishing Fleets, and the senior officer of each foreign man-of-war. He invested the two Commanders-in-Chief, Admirals Sir Roger Backhouse and Sir Dudley Pound, with the G.C.V.O., and conferred knighthoods on three Vice-Admirals, Geoffrey Blake, 2nd in Command of the Mediterranean Fleet, Gerald Dickens, Commanding the Reserve Fleet, and Dudley North, Commanding H.M. Yachts. At three o'clock in the afternoon the Royal Yacht left the South Railway jetty for Spithead, to receive a royal salute of twenty-one guns as she cleared the ship channel from the harbour. Preceded by the Trinity House yacht Patricia—it is the privilege of the Master and Elder Brethren of Trinity House to pilot His Majesty when he goes afloat in State—and followed by the Admiralty yacht Enchantress and a string of liners conveying Government guests, the Victoria and Albert traversed the length of the lines twice before securing to a buoy at the head of the Fleet. Their Majesties, attended by a numerous suite, were on the bridge of the yacht; the ships' companies of the Fleet manned ships during the royal progress, and each cheered the King and Queen as they passed.

After the Fleet came the turn of the Fleet Air Arm. According to the original arrangements the squadrons composing it were to fly past twice, first from east to west, afterwards returning in the opposite direction, dipping in salute during the second movement. The lowness of the clouds, however, would have made the second part of the programme dangerous, and it was therefore cancelled by the Vice-Admiral Commanding Aircraft, Vice-Admiral N. F. Laurence, who was aloft in the leading squadron.

In the evening the Fleet was illuminated, and the usual searchlight display was given, for the benefit of spectators ashore as well as those afloat, supplemented by intervals of fireworks.

The number of spectators was probably greater than at any previous function of the same sort. Besides the five large liners which carried Government guests and followed the Royal Yacht in her progress round the Fleet, there were many others, used as floating grand stands during the Review, and cruising round the lines before and afterwards; and private yachts seemed innumerable, while river, ferry, and excursion steamers had gathered from every port in the Kingdom; and all were crowded. Ashore, the beaches of Southsea, Gilkicker, and Stokes Bay were covered with dense crowds, while after dark even the ridge of Portsdown Hill, whence on a clear day a view of the whole of Spithead is gained, was covered with spectators of the illuminations. It was not until well on in the small hours of the next morning that the visitors' cars were finally able to sort themselves out and get away.

The following day the King visited the Nelson, Queen Elizabeth, and Dunedin, flagships of the Home, Mediterranean, and Reserve Fleets respectively. Afterwards he went on board the new cruiser Southampton, flagship of Rear-Admiral T. F. P. Calvert, Commanding the 2nd Cruiser Squadron of the Home Fleet. During his tour, machines of the Fleet Air Arm flew overhead in formation. In the afternoon the Royal Yacht went up harbour again, and their Majesties returned to London by train from the Dockyard. On completion of his visit to the Fleet, the King gave the order to "Splice the main brace," and made the following general signal to all ships and establishments at home and abroad.

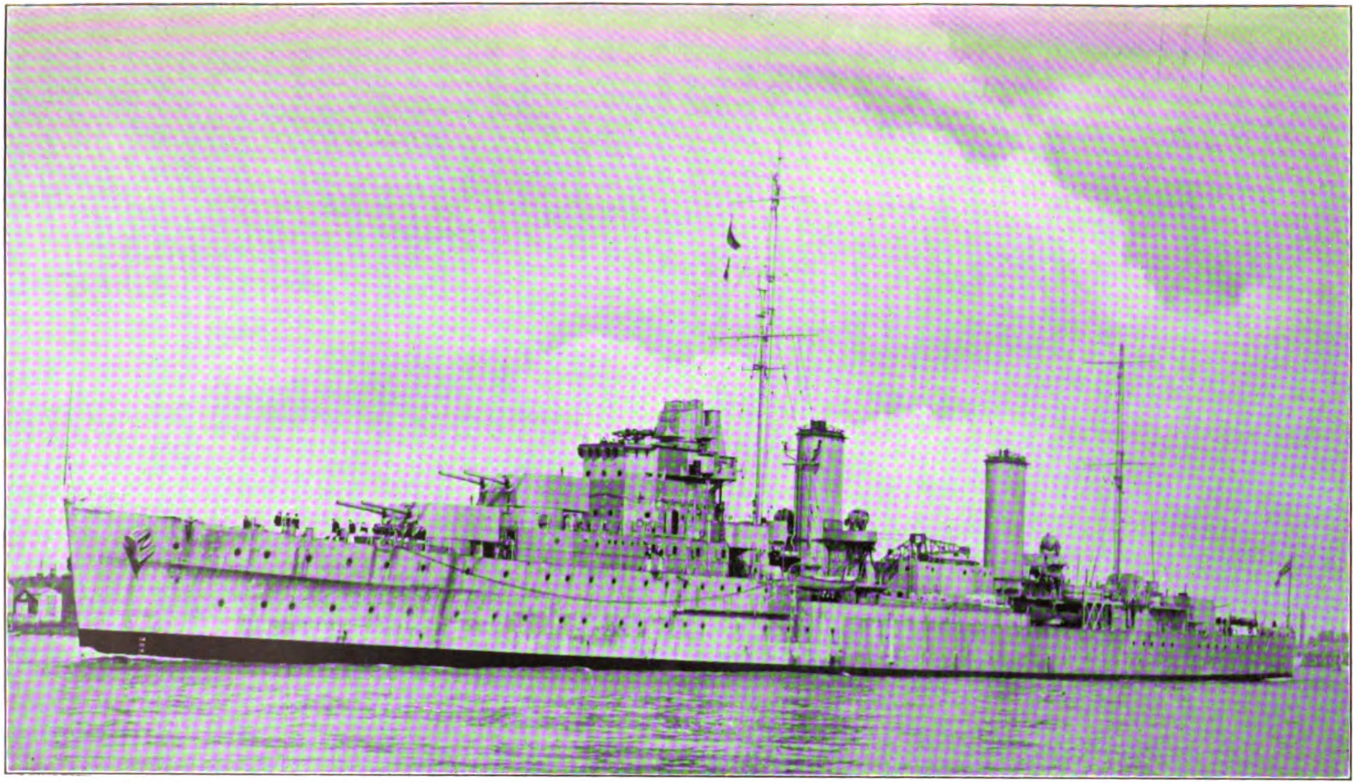
> It has been a great happiness to me to return even for a short time to my old life at sea and to the Service in which my early years were spent.
>
> All that I have seen in these two days has shown me that the traditions of efficiency and smartness which were cherished with such pride are being wonderfully upheld. I offer to all ranks and ratings of the Royal Navy my warm congratulations. Equally glad have I been to see the ships of the Merchant Navy and Fishing Fleets.
>
> I know that I am speaking for the whole Empire when I say how pleased and glad we have been to welcome the warships from foreign countries at the Review. I hope that our visitors will take back with them the happiest recollections of their stay among us.
>
> The Queen and I send best wishes to all my seamen, and I look forward greatly to further visits which I hope to pay them in the future.
>
> GEORGE, R.I.

After Their Majesties' departure, the Fleet began to disperse. The Reserve Fleet left for its Home Ports at five o'clock that day, as did some of the foreign men-of-war, and all the latter left before the week-end. Altogether, there were in Spithead during the Review on the Thursday 1,060 ships, 141 British and Dominion men-of-war, 16 foreign men-of-war, 127 liners, and 764 yachts. This was 87 more than had been present at the Jubilee Review in 1935.

In the Coronation Honours List the First Sea Lord, Admiral of the Fleet Sir Ernle Chatfield, was created a peer, and took the title of Baron Chatfield. This was the first occasion on which a peerage has been conferred upon a serving naval officer in time of peace since that of Lord Fisher of Kilverstone in 1909.

NAVAL TREATIES.

The London Naval Treaty of 1936 provided that the limit of calibre of the guns of capital ships should be reduced to 14 inches; but that unless all the signatories of the Washington Treaty of 1922 should accept this reduction by April 1, 1937, the limit should remain at its former figure of 16 inches. Italy accepted the limit in January; but as the Japanese Government refused to commit itself in any way, the reduction lapsed and the treaty limit reverted to 16 inches. In consequence the United States decided to mount 16-in. guns in the two battleships ordered at the beginning of the year.



H.M. CRUISER AURORA.

Built at Portsmouth Dockyard, Commissioned for Service, November 9, 1937.

(Photograph by Cribb, Southsea.)

The Treaty was ratified by France on June 23, and by His Majesty's Governments in the United Kingdom, Canada, Australia, New Zealand, and India on July 30, thus coming into force between the signatories. The latter ratification was made possible by the conclusion, on July 17, of Anglo-German and Anglo-Russian bilateral naval agreements in virtually the same terms as the main treaty.

ANGLO-GERMAN AND ANGLO-RUSSIAN AGREEMENTS.*

The text of these agreements, so far as it differs from that of the London Treaty, will be found in the Reference Section of this volume, together with that of the notes exchanged between the British and German Governments at the time of signature of the agreements. The differences were concerned chiefly with the provision known colloquially as the "cruiser holiday," whereby it was undertaken that no more "A" class cruisers (mounting guns exceeding 6·1 inches), or "B" class cruisers (where guns do not exceed 6·1 inches) over 8,000 tons should be built or acquired during the term of the Agreement—*i.e.* before January 1, 1943. Each Agreement provides formally that either party to it shall have the right to depart from this provision on notifying the other party; and that the other party on receiving such a notification shall have a similar right, and is also authorised to pass on the notification, confidentially, to any other Power with which it is in similar treaty relations.

The significance of this variation from the text of the main Treaty is explained in Mr. Eden's note to Herr von Ribbentrop.† Under the Anglo-German Naval Agreement of 1935 ‡ the German Government would be entitled to provide themselves with 5 "A" class cruisers; but in 1935 they had agreed, in order to facilitate the negotiation of the London Naval Treaty for which the preliminary conversations were then in progress, not to build the fourth and fifth vessels of that class. In the course of the later Anglo-German and Anglo-Russian discussion, however, it became known that the Russian Government's intention was to provide themselves with seven new cruisers; and as the only gun which the Russian arsenals had developed and were in a position to produce was a 7-in. gun, these cruisers, though they were to be of only 8,000 tons, would fall into the "A" class. If this Russian programme should materialise, the German Navy would not be content to limit itself to three "A" class cruisers, but would provide its full quota of five; but it was agreed that, in that event, Germany being still within the 1935 Agreement, would not be regarded by this country as having broken the cruiser holiday.

There the matter now stands. There is, so far as is known, no evidence of the Russian cruiser programme having been put in hand; and in view of the length of time that the building of warships in Russian yards has needed of recent years, it would seem on the whole unlikely the increase in the German cruiser programme will actually materialise.

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* See p. 348 *et seq.*

† See p. 356.

‡ See "Brassey," 1936, p. 311.

The other difference from the Treaty text is to be found in the Anglo-Russian Agreement. The Russian Government regards its Far Eastern Fleet as something completely distinct from the rest of its naval forces—a view which cannot be adjudged unreasonable after the experience of the Russo-Japanese war of 1904. In respect of her Far Eastern Fleet, Russia does not undertake to exchange information; and she holds herself free to depart from any of the Treaty qualitative limitations if Japan, or any other Power in the Far East, should exceed them. She undertakes, however, to inform the British Government of any intention so to exceed the Treaty limitation, and not to transfer any vessel so built to any other station.

The Anglo-German and Anglo-Russian Agreements were ratified on November 4, 1930, and came into force immediately.

At the same time that the conversations which eventuated in these Agreements were being carried on, the subject was also being discussed with the Baltic Powers and with Turkey, with a view to the inclusion of those Powers also in the Treaty system. The result of those conversations had not, however, up to the end of the year been embodied in any formal instrument.

SPANISH WATERS.

Throughout the year the civil war in Spain and the situations arising out of it kept the Royal Navy busy in those waters. Its duties were diverse. Both sides in Spain endeavoured at times to interrupt foreign ships trading to ports in the occupation of their enemies. Since, however, the British Government did not recognise the right of either Republican or Nationalist force to interfere with British ships on the high seas, the Navy was charged with the duty of protecting them. The " Non-intervention Scheme," adopted by twenty-six countries, involved for some considerable time a patrol of the Spanish coast, with the object of detecting and reporting any infractions of the agreement not to supply war material to either side. From time to time, a coastal region changed hands, the refugee problem cropped up again, and the Navy concerned itself with the protection and evacuation of refugees. After a series of attacks on merchant ships, of many nationalities, by submarines and aircraft, an anti-submarine patrol of destroyers, assisted by flying-boats, was instituted in the Mediterranean in September.

The interference with British merchant ships on the high seas, against which the Navy had to provide protection, was chiefly on the north coast of Spain. Early in the year the British force there consisted of destroyers only, since the only duty laid upon them was the rescue of refugees. When in March, however, the Nationalist forces began their campaign against the Republican provinces on the coast, the former's attempts to isolate their enemies by sea as well as by land produced a series of difficult situations, with which it was not easy for a junior officer in command of a weak force to deal adequately. On April 6 the 8th Division of destroyers, under the command of Commander Caslon in the Blanche, was confronted with an attempt by the Spanish Nationalist cruiser Cervera to arrest on the high seas the British merchant ship Thorpehall, bound for Bilbao. As a signalled request to the Spanish cruiser did not secure the abandonment of that attempt, Commander Caslon solved the problem by clearing away his guns and steaming his division between the ships; whereupon the Cervera departed. After that incident, the British detachment in the Bay of Biscay contained one, or sometimes two, heavy ships, and was put under the command of a flag officer.

The action of H.M. ships in the Bay of Biscay, and the orders of the Government on which they were based, were subjected to severe criticism in Parliament and elsewhere by partisans of both Republican and Nationalist. The former complained that the Navy, by giving warning to British merchant ships of the dangers they would encounter by entering Spanish territorial waters in the war zone, was making the Nationalists' illegitimate blockade effective by exaggerating the dangers of running it, and thereby discouraging merchant ships from doing so. The latter complained that the Navy, by preventing Nationalist forces from interrupting on the high seas the communications and supplies of their antagonists, were making impossible the perfectly legitimate Nationalist blockade. Both these criticisms were, of course, unjustified, and being mutually destructive were good evidence of the impartiality both of the Navy's actions and of the policy it was putting into force.

As each Basque and Asturian stronghold was captured in turn, large numbers of Republicans sought refuge from the advancing Nationalists. The only escape for these was by sea, and they were transported chiefly by merchant ships. In the course of the year, British merchant ships transported some 25,000, landing them in France, whence they were sent across the frontier into Republican Spain. After the fall of Gijon in October, British men-of-war picked up at sea some 1,350 who were endeavouring to make their escape in tugs and other small craft. The British force was finally withdrawn in November, when all fighting in that area had ceased.

On the Mediterranean Spanish coasts the Navy's service was not without its dangers and casualties. On April 6 H.M.S. Gallant, destroyer, on "non-intervention" patrol off Cape San Antonio, was bombed by a Nationalist aeroplane but not hit. The Nationalist naval authorities apologised.

On May 13 H.M.S. Hunter, destroyer, was lying stopped off Almeria on "non-intervention" patrol about 10 miles from the coast when a drifting mine exploded against her side abreast the boiler-rooms, killing eight and injuring fourteen of her company, and completely disabling her. Her captain, Lieutenant-Commander Scurfield, was later awarded the Albert Medal for his presence of mind, energy, and courage in personally rescuing several men from the wrecked compartments. The ship was towed into Almeria by Republic Spanish craft, and after examination by divers was towed to Gibraltar for docking by H.M.S. Arethusa.

In August, a series of attacks on merchant ships, of various nationalities, by submarines and aircraft, in various localities ranging from off the Spanish coast to the Dardanelles, led to orders being issued to the British and French Mediterranean fleets at once to counter-attack any submarine found attacking their merchant ships. The attacks on merchant ships continued, and in August 31 H.M.S. Havock, destroyer, was attacked by a submarine almost in the same position in which the Gallant had been bombed five months before. The torpedo missed the Havock, who counter-attacked, assisted by other destroyers who joined her; the result of the counter-attack, however, was not known, as nothing more was seen of the submarine.

Early in September the Mediterranean Fleet was reinforced by destroyers from the Home Fleet. On September 10 the Conference of Mediterranean Powers assembled at Nyon, near Geneva, and in four days agreed upon a scheme * for routing all merchant traffic in the Mediterranean, and patrol of the routes by torpedo and aircraft of the British and French Navies. The Mediterranean Fleet was further reinforced by destroyers from the Home Fleet and by two squadrons of R.A.F. flying-boats, Nos. 209 and 210, from the Coastal Command at home; the latter were based upon H.M.S. Cyclops, which was stationed at Arzeu, near Oran, for that purpose, and accommodated the 250 or so R.A.F. personnel needed. They were placed under the operational control of the Commander-in-Chief, Mediterranean Fleet, and worked in close co-operation with the destroyer patrols.

From the institution of the Nyon patrols, the submarine and air attacks on merchant ships on the high seas ceased suddenly. The patrols, however, were maintained in full strength up to the end of the year, when the flying-boats and Home Fleet destroyers were withdrawn. Italy had not participated in the Nyon Conference; but a few weeks afterwards the Italian Navy, under arrangements concluded at a separate conference in Paris, took over a full share of the patrol.

PALESTINE.

The Navy had no part in controlling the disorders in Palestine, such as fell to its lot in 1936. But when the members of the Higher Arab Committee were arrested and deported on October 1, they were taken on board H.M.S. Sussex at Haifa, whence she immediately sailed. They were later transferred to the destroyer Active, which conveyed them to the Seychelles, the place of their exile.

DISPOSITION OF SHIPS.

There has been no major redistribution of ships such as marked the preceding years, but new ships as they came into service have gradually replaced earlier ships.

The 2nd Cruiser Squadron of the Home Fleet has been completely reconstituted during the year with four ships of the "Southampton"

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* See p. 75.

class—Newcastle, Glasgow, and Sheffield, in addition to the name-ship—with the addition of the 8-in. gun cruiser Cornwall after her large refit. This marks the beginning of the reversion to the standard of five ships in each cruiser squadron, providing a normal strength of four with allowance for refitting.

Of the former ships of the 2nd Cruiser Squadron, the Leander and Achilles were transferred to the New Zealand Government, replacing the Dunedin and Diomede, which have reverted to reserve; the Orion joined the America and West Indies Station in August, replacing the Dragon; and the Neptune joined the Africa Station in November, replacing the Carlisle.

The Danae was withdrawn from the China Station in October, on the return thither of the Dorsetshire, which the Danae had replaced during a refit.

During the year the "A" class destroyers, of which the 3rd Destroyer Flotilla of the Mediterranean Fleet was formed, were gradually replaced by the new destroyer of the "I" class as they were completed.

RESERVE SHIPS ABROAD.

The 2nd Minesweeping Flotilla, consisting of the twin-screw minesweepers Abingdon, Huntley, Fareham, Aberdare, Harrow, Widnes, Stoke, Derby, and Bagshot, has been for some years past in reserve at Malta. The ships were commissioned during the Abyssinian emergency, and while they were still fully manned, opportunity was taken to transfer the flotilla to Singapore in March, where they were again reduced to reserve. Other craft such as would be needed for local defence in war are to be added to the Singapore reserve in due course, as they become available and opportunity offers for their passage to the East.

The 2nd Minesweeping Flotilla has been replaced in the Malta reserve by the 3rd, which has been formed of the twin-screw minesweepers Saltash, Lydd, Elgin, Albury, Dundalk, Fermoy, Pangbourne, Dunoon, Ross, and Sutton, from the reserves at home. The Fermoy, Saltash, Elgin, and Lydd were transferred in January to Alexandria, where they are to be kept in reserve.

VISITS TO FOREIGN PORTS.

H.M.S. Resolution, during the Spring Cruise of the Home Fleet, visited Lisbon from February 16 to 23. This was the first occasion for some years on which a formal visit to the Portuguese capital has been paid by one of H.M. ships.

In April the Commander-in-Chief of the Mediterranean Fleet, Admiral Sir Dudley Pound, paid official visits to his French and Italian opposite numbers at Toulon on April 9–10 and Spezia on April 16–18, respectively.

After the Coronation Review, the Rodney, flying the flag of the Commander-in-Chief Home Fleet during the refit of the Nelson, paid a visit to Oslo from June 21 to 30, while units of the Home Fleet visited other Norwegian ports.

In July "naval fêtes" were held at St. Malo, at which the destroyers Verity and Amazon, from the Portsmouth command, were present.

H.M.S. York, flagship of Vice-Admiral Meyrick, visited Newport, Rhode Island, during the races for the America's Cup.

In September two visits of importance were paid in the Mediterranean. The first was that of the 1st Cruiser Squadron to Venice from September 1 to 7. The second was that of the Rear-Admiral Commanding the 3rd Cruiser Squadron, in H.M.S. Arethusa, with three destroyers of the 3rd Flotilla, to Istanbul. At the same time H.M.S. Despatch visited Varna in the Black Sea, and her captain was received by His Majesty King Boris of Bulgaria, who also visited the ship and took lunch on board. These squadrons received the most cordial welcomes from their respective hosts, and the visits were considered to have had a most beneficial effect on international relations.

MISCELLANEOUS INCIDENTS.

The incident at Keeling in Formosa, on October 7, 1936, referred to in last year's "Brassey," in which two British seamen were maltreated and an officer insulted in the Japanese police station, was finally settled in April. The Civil Administrator in Formosa then wrote to the British Consul expressing regret and giving an assurance that measures had been taken to prevent any recurrence of such incidents. The delay in settling this affair was ascribed to difficulty in reconciling the British account of events with that of the local officials and the latter's ignorance of English.

H.M.S. Malaya, when on passage to the Mediterranean after a long refit at Devonport, came into collision in a fog on February 7 off the Portuguese coast with the Dutch steamer Kertosono. Both ships were damaged, but there were no casualties. The Malaya returned to Devonport for repairs to her bulge, which were completed in June.

On July 30 a Court of Enquiry was assembled at Portsmouth to enquire into certain incidents which occurred in H.M.S. Warspite on June 30. These arose out of an unfounded rumour to the effect that the week-end leave of the ship's company, who belonged to Chatham though the ship was at Portsmouth for repairs to her machinery, was to be stopped. A few ratings, under the influence of some of their number who apparently persuaded them that collective action was the best method of obtaining redress for a fancied grievance, adopted that method instead of complying with the Service regulations and procedure for putting forward requests. As a result of the enquiry, the Admiralty concluded that the discipline of certain ratings had been unsatisfactory, and that the situation which arose was not handled adequately by the officers concerned. They therefore ordered the discharge to the shore of two or three ratings, services no longer required, the drafting to other ships of some nine or ten other ratings, and the relief of the commander and two other officers of the ship.

In January H.M.S. Ajax, of the South American Division of the American Station, was in the vicinity of Cape Horn when a message was received from the Royal Research Ship Discovery that the latter's survey party, of six officers and men, which had been landed on King George Island of the South Shetlands, was missing. The Ajax immediately made for the South Shetlands and joined in the search, and the party was found by her cutter and the Discovery's boats some days later. They had run out of food and had been living on seals.

Five months later the Ajax was called upon for a very different duty in very different surroundings, when her marines were landed at Trinidad to protect the oil-fields against damage by riotous strikers. So serious was the rioting that the Exeter was also sent to the island, and landed strong parties both of seamen and marines. The landing parties soon succeeded in restoring order.

The following month, in July, H.M.S. Apollo was called on for similar duty at Barbados. The West Indian strikes appear to have been the result of discontent and unrest arising from the increasing cost of living.

H.M.S. Carlisle visited Tristan da Cunha in February carrying large quantities of stores and gifts to the islanders. This visit is arranged by the Colonial Office every three years. On her return, she brought the Chaplain of the island, the Rev. H. Wilde, who was the bearer of the islanders' coronation gifts to the King, and two of the islanders who were in need of surgical treatment.

CHINA.

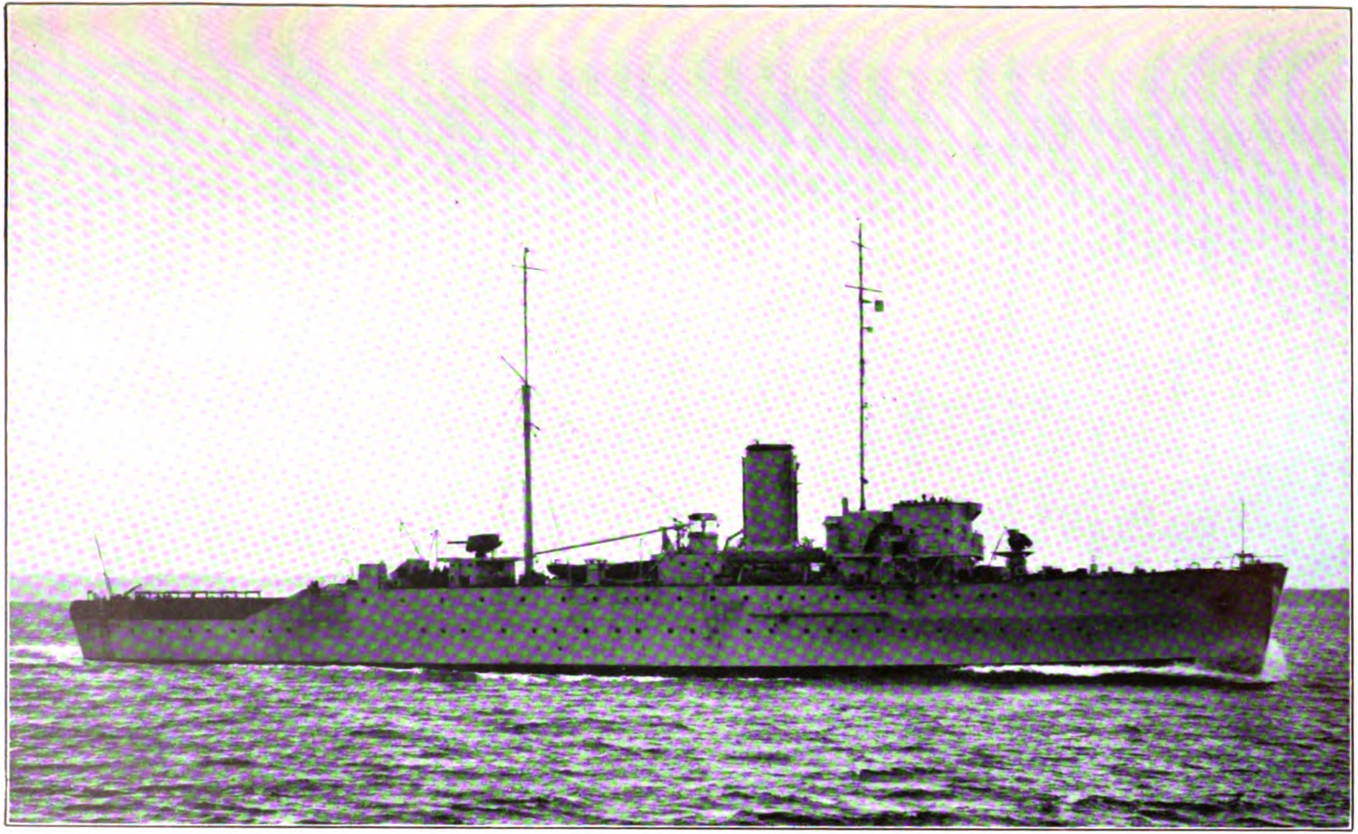
The Japanese hostilities against China which began in August, though not a formally declared " war," were a constant preoccupation to the British forces in the Far East, of whom the Senior Officer is the Naval Commander-in-Chief. One of the earliest measures adopted by the Japanese was a " blockade " of Chinese shipping. No question of recognition of this blockade by foreign Powers or of their shipping submitting to visit and search could arise, since no declaration of war, which alone could validate interference with foreign shipping, had been made. The Japanese, indeed, disclaimed any intention of interfering with foreign ships, but on more than one occasion a foreign ship was stopped and boarded for her nationality to be verified. The British Government raised no objection to this procedure, though they informed the Japanese Government that, if a British man-of-war were present, she would make the verification herself.

The British Navy's activities in the early months of the war were confined to the organisation and assistance of refugees. Large numbers of British subjects in Shanghai whose homes or places of business, being in the Yangtse-poo area, which was the centre of the fighting, were either destroyed or inaccessible, were evacuated to Hong Kong or elsewhere. From time to time the news of Japanese attacks on Swatow, Amoy, and other ports having made them unsafe for foreigners, caused calls for the presence of British men-of-war.

In normal circumstances the cruiser Capetown, which is stationed at Hangkow during the summer, would have come down river about October before the fall of the river made navigation impossible. By that time, however, the Chinese had blocked the river below Nanking against the Japanese, and there was a prospect that the Capetown might have to spend the whole winter up river. As she was not stored for that contingency, it was decided to evacuate a number of her ship's company, and in consequence twelve officers and 110 men left Hankow by train on October 6 for Canton and Hong Kong. The Japanese forces, which had made several attacks on the railway line, were informed of the journey, and undertook to respect the train. Notwithstanding the clear marking of the train with British flags, however, it was twice attacked by aircraft during its passage, fortunately without damage. The party had to change trains once, a bridge having been too much damaged by aircraft attack to be safe for the train to cross. Eventually they arrived safely at Hong Kong on October 10.

The Capetown herself came down the river after the fall of Nanking had opened it, and though she grounded more than once on the passage, she reached Shanghai safely on December 31.

The most serious incidents of the war in which British ships were involved, however, took place on December 12, the day on which the U.S.S. Panay was sunk, between Nanking and Wuhu, after the fall of the former. On that day, H.M. Gunboats Cricket and Scarab, in company with a number of British merchant ships in an area which the Japanese authorities had previously designated as a safety zone, were attacked three times by bombs from the air, though fortunately they were not hit. A number of British merchant vessels were also anchored just below Wuhu, another area in which, according to Japanese assurance, they would be safe. Despite this assurance they were fired on heavily by machine guns from the shore, whereupon H.M.S. Ladybird got under weigh and steamed towards the guns to stop them. Fire was then opened on her by Japanese field guns on shore, to which she did not reply, but continued to steam direct for the guns until she was so close that they could no longer bear on her. About 100 rounds were fired and the Ladybird was hit six times. Sick Berth Attendant Lonergan being killed, and Petty Officer Smallwood seriously wounded, and others, including Captain O'Donnell, slightly wounded. Captain O'Donnell then went ashore, accompanied by Lt.-Col. Lovat-Fraser, the military attaché, who happened to be on board, to protest against the unwarrantable attack, and their presence ashore was instrumental in preventing H.M.S. Bee, which arrived shortly afterwards with Rear-Admiral Holt on board, from being similarly fired on. Admiral Holt also landed and interviewed Colonel Hashimoto, the Japanese officer in command. He was given to understand that the Japanese forces were under orders to fire at any ships mooring on the river, in order to prevent Chinese troops from Nanking retreating that way, and that they were not capable of recognising foreign flags.



H.M. NETLAYER PROTECTOR.

Commissioned for Service, December 30, 1936.

(By courtesy of the builders, Messrs. Yarrow and Co., Ltd., Scotstoun.)

Admiral Holt warned the Japanese officer of the serious consequences which would follow any repetition of attacks on foreign ships, and the next morning, since he was going down the river to rescue the survivors of the American Gunboat Panay—also attacked on December 12 and sunk—demanded that a Japanese officer and six men should be sent aboard as a guarantee against attack. As they had not arrived by the time fixed for his departure in the Bee, he left without them.

The survivors of the Panay and the four American merchants vessels sunk with her were located, taken on board, and given medical assistance the following day. The United States Ambassador to China later sent to the British Chargé d'Affaires a cordial letter of thanks and appreciation for these services, rendered " in a manner most gallant and in keeping with the highest naval traditions."

EXERCISES.

There was again no large-scale strategical exercise by the combined Home and Mediterranean Fleets in 1937. The two fleets met, however, at the beginning of March at Gibraltar, and a series of tactical exercises were carried out in the Atlantic, to the westward of the Gut. No reports of these were made public, beyond the fact that heavy weather compelled the abandonment of part of the exercises planned.

The usual, combined exercise for all three Services took place at Singapore in February. The naval force from the China Fleet consisted of the Cruisers Cumberland (flag of C.-in-C.) and Dorsetshire, the aircraft carrier Hermes, nine destroyers, two sloops, and ten submarines. The cruisers Norfolk (flag of C.-in-C.) and Emerald, from the East Indies Station, also took part, while the defences were reinforced by R.A.F. squadrons from Egypt, Irak, and India. The exercise included air raids on the fortress by the aircraft of H.M.S. Hermes, bombardment by the attacking cruisers, and the landing of a military force at Blakang-Mati ; the defending aircraft, submarines, and destroyers made counter-attacks on the enemy forces.

A similar exercise which also included a " black-out " at night and a test of the emergency arrangement for food supply, took place at Hong Kong in March.

EXERCISES AT HOME.

Two interesting exercises were carried out in home waters in the summer. In the first, from June 28 to July 5, entitled a " Trade Defence Exercise," trade in the western approaches to the British Isles was attacked by the Southampton (Rear-Admiral Calvert), of the 2nd Cruiser Squadron, and the oiler Prestol, which represented an armed merchant-ship raider, and was allowed to disguise herself. In order to make a capture, the attacker had to approach within a mile of any British merchant ship found in the manœuvre area, and remain in that position for 45 minutes, sending off a wireless message such as the "captured" ship might be able to get off in war. The merchant ships thus used as targets in the exercise were not delayed. They were merely asked to fly a special flag until out of the area, to indicate that they had already been "sunk," so that they should not be brought into the game twice over. The defending force consisted of the aircraft carrier Glorious (Rear-Admiral Binney) and her aircraft, the cruiser Newcastle, the destroyer Brazen, which was reckoned as a sister-ship to the Newcastle, and Nos. 201 and 208 Flying-Boat Squadrons, working from Scilly and Plymouth respectively under the orders of the Air Officer Commanding 16th Reconnaissance Group, but co-operating with Admiral Binney.

The Southampton and Prestol worked independently and widely separated from one another. The latter was located and bombed by flying-boats from Scilly at noon on the first day—the exercise had begun at 6 a.m.—before she had made any captures. She retired to alter her disguise—which was not very difficult to penetrate. The Southampton, on the other hand, had more of a run for her money. She made her first prize at 6.15 a.m., her second five hours later, and a third three hours later still. Three hours after that, however, she was located by the third aerial reconnaissance sent off by the Glorious, and an hour later was attacked by an air striking force of eighteen of the Glorious's aircraft, and adjudged to be sunk.

On the second day flying was not possible from Scilly until 2 p.m. but the Plymouth flying-boats carried out their search, as did the surface ships and the Glorious's aircraft. The Prestol, however, was not located; though on the other hand she made no captures. On the third day low visibility prevented all flying; the Prestol, however, was located and sunk by the Newcastle, though she very nearly escaped in the fog.

The exercise was resumed on the fourth day and continued for another four days, many captures being made, including that of the Queen Mary, by the Prestol. No flying was possible on the fifth day and very little on the sixth, but by the evening of the seventh day both raiders had again been located and sunk.

The exercise demonstrated very clearly that the assistance of aircraft is of enormous assistance to naval forces engaged in searching for isolated raiding enemies; but that there are many days, even at the most favourable time of year, when it is not available.

COAST DEFENCE EXERCISE.

The second exercise took place on July 14, 15, and 16; it was designed chiefly to give practice to the garrisons at Plymouth, Rutland, and Portsmouth and the R.A.F. units detailed to co-operate with them. The opportunity was taken to mobilise and test the "Air Raid Precautions" organisation in the Portsmouth-Southampton area.

The attacking force consisted of the Home Fleet, which included the Courageous and Furious with their aircraft. The defending forces, in addition to the garrisons, reinforced by artillery and anti-aircraft units of the Territorial Army, consisted of the local defence and training flotillas, four Flying-Boat, two Torpedo-Bomber, one Bomber, three General Reconnaissance, and two Fighter Squadrons.

There was little realism about the exercise from the attacking side, for an enemy coming from the Azores, as the attackers were supposed to do, would hardly in reality steam 300 miles parallel to a hostile coast, well equipped with air reconnaissance, before delivering an attack the following day; yet this was required of the force which attacked Portsmouth. Its task was in reality, of course, more to provide targets for the defence, to simulate the circumstances in which the defences might come into action in war. Those defences never did, in fact, come into action in the Great War, but it is not possible for that reason to dispense with them.

Numerous attacks were made, on all three defended areas, by naval air detachments—the latter from the Fleet Air Arm. Valuable practice in inter-Service co-operation was afforded to the defence; and not the least valuable experience gained in the exercise derived from the fact that the weather was bad. The Flying-Boat Squadrons successfully located and shadowed attacking forces well out at sea, but the counter-attacks of the bombers were much hampered by the bad weather which set in on the second and third days; it also served to render impossible the landings which had been planned by the attackers. This was the first occasion of recent years that the Coast Defence organisation of the three Services has been mobilised on so large a scale, and no doubt the experience gained will have suggested some respects in which the organisation can be bettered.

OTHER EXERCISES.

In September and October the movement of the Home Fleet from the Channel to northern ports, and back again, was utilised to give practice to various R.A.F. units, in locating ships at sea, in night shadowing, and in co-operation both with surface ships and with submarines.

BOARD OF ADMIRALTY.

On May 28, Sir Samuel Hoare was succeeded as First Lord by Mr. A. Duff Cooper, Lord Stanley was succeeded as Financial Secretary by Mr. Geoffrey Shakespeare, and Mr. Kenneth Lindsay was succeeded as Civil Lord by Colonel J. J. Llewellin.

The only change among the naval members of the Board took place in October, when Vice-Admiral Sir Percy Noble was succeeded as Fourth Sea Lord by Rear-Admiral Geoffrey Arbuthnot.

On August 10, after the Government decision to transfer administrative control of the Fleet Air Arm from the Air Force to the Navy, it was announced that Rear-Admiral J. H. D. Cunningham, the Assistant Chief of the Naval Staff and a member of the Board, would in future be known as "Assistant Chief of the Naval Staff (Air)." At the same time the appointment of Captain L. E. Holland to be "Assistant Chief of the Naval Staff," but not a member of the Board, was also announced.

FLAG COMMANDS.

In May Vice-Admiral Sydney Meyrick succeeded Admiral Sir Matthew Best as Commander-in-Chief America and West Indies Station.

In July Admiral the Earl of Cork and Orrery became Commander-in-Chief, Portsmouth, in the vacancy caused by the death of Admiral Sir William Fisher.

In October the appointments were announced of Vice-Admiral Sir Percy Noble to succeed Admiral Sir Charles Little as Commander-in-Chief, China Fleet, and of Rear-Admiral G. H. D'Oyly Lyon to succeed Vice-Admiral Sir F. Tottenham as Commander-in-Chief, Africa Station.

In July Vice-Admiral A. B. Cunningham was appointed Vice-Admiral Commanding Battle Cruiser Squadron and 2nd in Command, Mediterranean Fleet, temporarily in the illness of Vice-Admiral Sir Geoffrey Blake. His appointment was made permanent later, on Sir Geoffrey Blake's retirement through ill-health.

The same month Vice-Admiral M. K. Horton succeeded Vice-Admiral Sir Gerald Dickens in the command of the Reserve Fleet.

There were several other changes in minor flag appointments, both afloat and in naval establishments ashore.

OBITUARY.

Admiral Sir William W. Fisher, G.C.B., G.C.V.O., Commander-in-Chief, Portsmouth, died suddenly in London on June 24. He was one of the most brilliant as well as one of the most popular officers of his generation. He was buried at sea.

Amongst other distinguished naval officers who died during the year were Admirals David Norris, who performed brilliant service on the Caspian Sea in 1918–19; Sir S. Gough Calthorpe, Commander-in-Chief in the Mediterranean at the end of the War; Sir George Hyde, the first flag officer in the Royal Australian Navy; Paymaster-Rear-Admirals Share and Weekes, who had been joint Secretaries to Lord Jellicoe during the War.

PERSONNEL.

PROMOTION TO FLAG RANK.

The Admiralty announced in June a change in the procedure for promotion to flag rank. Hitherto promotions had been made from the top of the Captain's list as vacancies occurred, by death, retirement, or promotion, in the Rear-Admiral's list. Henceforward, in order to regularise the flow on to the flag list, Captains at the top of the list would be promoted in batches half-yearly. The number to be promoted would be at Admiralty discretion, subject to a maximum establishment of Rear-Admirals of forty—one more than the number borne at the date of the change, though the average number would, of course, work out at less. No change was to be made in the method of promotion in the higher flag ranks. Up to the end of the year no further promotions to flag ranks were made.

The effect of the change was to reduce the uncertainty, which had hitherto existed, as to the length of time senior captains would serve in the rank.

SUPPLEMENTARY OFFICERS.

In February it was announced that commissions on a "Supplementary List" were offered to executive officers of the Royal Naval Reserve between the ages of 21 and 30, selected from those who proved themselves suitable. Supplementary Lieutenants were to be paid at a rate slightly higher than officers on the ordinary list, but would retire at the age of 45 on a slightly lower pension. They would be eligible for promotion to the rank of commander only in exceptional circumstances. Specialisation in submarines, flying duties (including observer), physical training, anti-submarine duties, and surveying would be open to them, with extra pay.

It was understood that this was a temporary measure, designed chiefly to cope with the immediate shortage of officers caused by the expansion programme. During the year, 124 commissions on the Supplementary List were granted in accordance with this offer.

COMMISSIONS FROM THE LOWER DECK.

In August the promotion of twelve acting Petty Officers to the rank of acting Sub-lieutenant was announced. This was the same number as in 1931, and larger than any other year since the War. Some comment, in Parliament and the Press, had been caused by the steady diminution of the number of commissions granted to the lower deck, and it had been suggested that an overhaul of the working of the existing regulations and arrangements for lower-deck promotions seemed to be overdue. This increase in the number was probably due to the increased demand for officers arising out of the expansion of the Navy now in progress. But the whole matter was at the same time reviewed, and in September a new series of arrangements for the selection and training of ratings suitable for commissions was issued in Fleet Orders.

A full description of this scheme, together with a history of earlier systems in force in the Navy, appears in Chapter VI. It is thus unnecessary to pursue the subject here.

TRAINING OF BOYS.

In April H.M.S. Caledonia—formerly S.S. Majestic—arrived at Rosyth and was berthed in the basin, as a training establishment for 1,500 seamen boys and 500 artificer apprentices. There are now five of such establishments, at Shotley, Sheerness, Gosport and St. Budeaux, in addition to Rosyth.

The system of drafting boys to special sea-going ships on passing out of the shore establishments has been continued, but the cruiser

Cornwall, of the 2nd Cruiser Squadron, has replaced the battleship Royal Sovereign in that duty.

RECRUITING.

Recruiting for all branches has been satisfactory throughout the year, and the numbers required have been readily forthcoming, except for artificers and artisans. Since all three Services, as well as private industry, have been competing for skilled artisans, of practically all trades, there was naturally some difficulty in getting the numbers required. But this was felt chiefly in the early part of the year. Service in the Navy has always had a particular attraction for Englishmen, and since steps were taken to make more generally known the material attractions of the sea service, in the shape of conditions, pay and prospects, numbers have been coming forward well.

REVIEW OF SERVICE CONDITIONS.

Of the 4,000 odd requests received during the Review of Service Conditions which took place in the autumn of 1936, 1,156 were dealt with during 1937 and the replies promulgated in Fleet Orders. Many of the requests put forward may well appear to the layman as trivial matters, which should hardly require such ponderous machinery for their consideration and determination. That view is unjustified. Even small and apparently trivial matters may make considerable difference to the comfort of personnel or the efficiency of their work, and thus have an important influence on their contentment. The knowledge that such matters can be represented direct to the highest Service authority, and that their representation will bring forth either amelioration or a full explanation of the reasons against any change, is the best method of ensuring that grievances shall not grow and rankle to the damage of naval morale.

COURSES FOR MERCHANT NAVY OFFICERS.

Courses of instruction for officers of the Merchant Navy were instituted in August at London, Liverpool, Glasgow, South Shields, Hull, and Cardiff. They were designed to give instruction in the methods of, and equipment for, the self-defence of merchant ships in time of war, and also in gun drill, fire control, convoy work in all its aspects, and similar subjects.

The courses are not rigid, but can be taken in half-day periods, as officers are available, until the whole has been worked through. They have been much appreciated and merchant navy officers have shown enthusiasm in attending them.

MISCELLANEOUS.

The privilege of wearing plain clothes on shore by ratings who hold a leading rate or above or two good conduct badges has been extended to cover such British ports abroad as are approved by the Commander-in-Chief.

The special scheme for life and endowment insurance, introduced for officers in 1936, was extended in 1937 so as to be available for ratings.

The Civil Employment Committee continued to do excellent work during the year, in placing ex-officers in positions in civil life. The National Association for the Employment of Regular Soldiers, Sailors, and Airmen continued to do the same for ex-ratings; 6,487 men from the Navy and 563 ex-Marines were placed in employment during the year.

Navy Week attendances again broke all previous records. A "Navy Weeks Trust" has been set up for the purpose of administering the funds received as the result of Navy Week, and holding property required for its organisation.

Lieutenant-Commander W. J. A. Willis, on his retirement in the autumn, was appointed Chief Constable of Rochester. This was the first occasion upon which an officer who was promoted to commissioned rank from the lower deck had been selected as Chief Constable.

DOMINION NAVIES.

ROYAL AUSTRALIAN NAVY.

Early in the year Captain G. P. Thomson, O.B.E., R.N., was lent from the Royal Navy, to succeed Captain P. E. Phillips as Second Naval Member of the Naval Board.

In July, the selection of Vice-Admiral Sir Ragnar Colvin, R.N., to succeed Admiral Sir George Hyde, R.A.N., as First Naval Member was announced in Canberra, and Sir Ragnar Colvin took up his duties in November. Sir George Hyde died on July 28, and in the interval before his successor could arrive, Captain Thomson acted as First Naval Member, with the temporary rank of Commodore, 2nd Class.

On December 6, the appointment was announced of Rear-Admiral W. A. Custance to succeed Rear-Admiral Lane-Poole in the Command of the Australian Squadron, to date February 26.

In the session of the Commonwealth Parliament in August, the subject of defence was dealt with at length. Mr. Lyons, the Prime Minister, expounded emphatically the Government's view that the Navy was the first line of defence, with the Army and Air Force supplementing and co-operating. If naval defence failed, Army and Air Force could not save Australia from being brought to terms by an enemy who commanded the sea; and it was therefore essential for Australia to make her contribution to the power of the British Navy to hold sea communications against any enemy, and to rely on that policy for her national security.

He announced that the cruisers Canberra and Australia were to be modernised, in the same way as their sister ships of the Royal Navy, and that the Dockyard at Cockatoo Island would undertake the construction of three small vessels for local defence.

The policy of the Government was opposed by the Labour Party, which advocated a policy of isolation, and reliance for defence upon a strong air force, to the exclusion of the Navy.

The preparation of plans for modernising the port of Darwin at a cost of £400,000 was announced in October. The importance of Darwin has been increasingly recognised of recent years since it has been the port of entry for the Imperial air route.

The usual cruises were made by the Australian Squadron, the flagship Canberra visiting Singapore from September 1 to 8, during a series of visits in the Dutch East Indies.

ROYAL CANADIAN NAVY.

The destroyers Fraser and St. Laurent (formerly Crescent and Cygnet of the R.N.) left Portsmouth in March for Barbados, where they were joined by the Saguenay and Skeena. There they were in company for a few days with the American Squadron of the R.N., under the command of Admiral Sir Matthew Best, before returning to their Home Ports. The Fraser then passed through the Panama Canal and visited the United States naval base at San Diego before taking up her station at Esquimault, in May; the St. Laurent, Saguenay and Skeena went to Halifax.

The Saguenay and Skeena later represented the Royal Canadian Navy at the Coronation Review at Spithead, and their Commanding Officer, Captain Victor Brodeur, R.C.N., was received by His Majesty on board the Royal Yacht.

Four minesweepers have been laid down in Canada, two in British Columbia and two in Eastern Canada. The defences of Vancouver Harbour are being strengthened and modernised.

ROYAL INDIAN NAVY

Rear-Admiral H. Fitzherbert, C.M.G., in November succeeded Vice-Admiral A. E. F. Bedford, C.B., C.S.I., as Flag Officer Commanding R.I.N. and Naval Adviser to the Commander-in-Chief in India and Defence Member of the Executive Council.

Improved rates of pay for officers of the R.I.N. were announced by the Secretary of State for India in January, to come into force in July.

The sloop Indus represented the R.I.N. at the Coronation Naval Review at Spithead. She was afterwards attached for a time to the 1st Minesweeping Flotilla for practice, and with them visited Liverpool. She returned to Indian waters in September.

The Sheik of Bahrein, with a retinue of 100 attendants, was conveyed from Bombay to Aden by a sloop of the R.I.N. on the occasion of his making the pilgrimage to Mecca.

NEW ZEALAND DIVISION OF THE ROYAL NAVY.

The flag of Rear-Admiral the Hon. R. Drummond, commanding the New Zealand Division, was transferred from the Dunedin to the Achilles on January 5. The Dunedin then left for England, where she joined the Reserve Fleet, becoming flagship of Vice-Admiral G. C. Dickens at the Coronation Review.

The Leander was commissioned in April to replace the Dunedin in the New Zealand Division. Before joining, she represented New Zealand at the Coronation Review; she reached New Zealand in August.

In March it was announced that His Majesty had approved of the following design of flag to be flown by the New Zealand Naval Board: the Admiralty anchor in gold, placed horizontally in the centre of a flag of red and blue, bisected vertically, the red portion being nearest the staff. The flag is entitled to a salute of fifteen guns, on the same occasions as those laid down for the Board of Admiralty in Article 66 of the King's Regulations and Admiralty Instructions.

H.M.S. Endeavour has been employed in surveying duties on the New Zealand Station since July.

H. G. T.

CHAPTER II.

FOREIGN NAVIES.

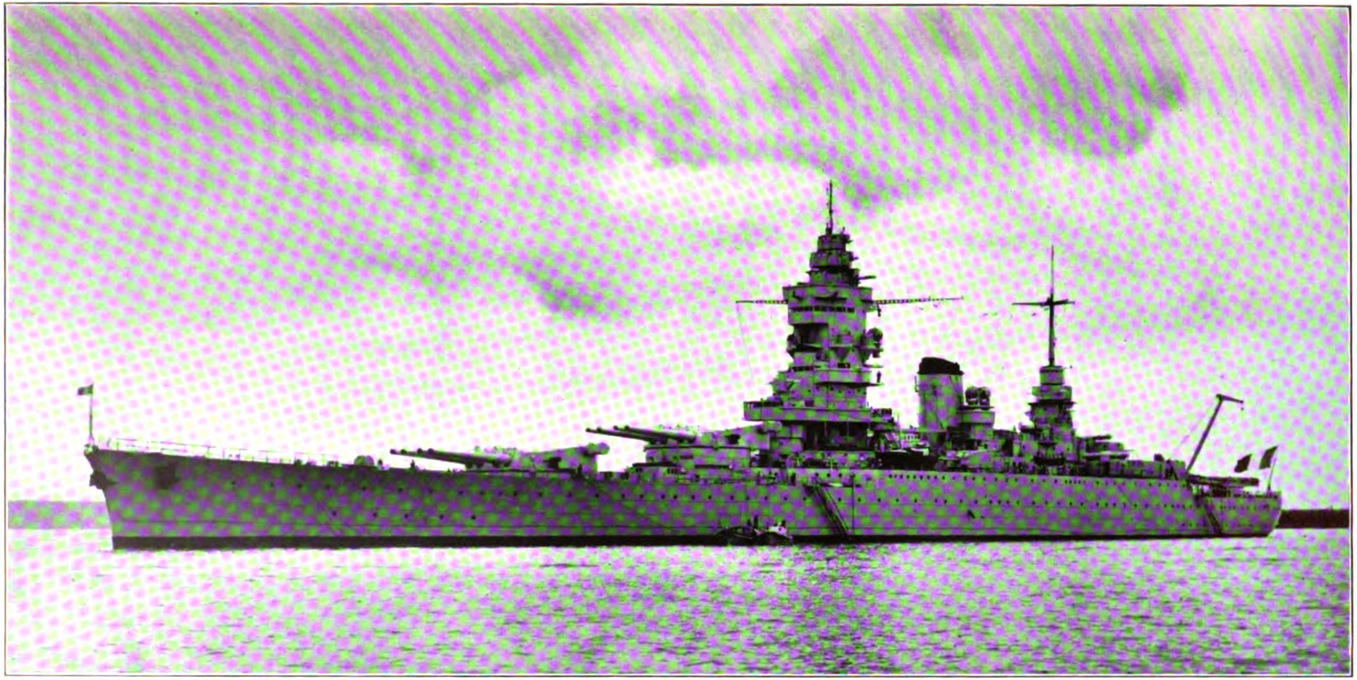
A YEAR ago, the introduction to this Chapter of " Brassey " focused attention on the fleets of those Powers which were most affected by the conflict in Spain. At the opening of 1938, thanks to the ceaseless activity of British diplomacy backed by the dominating influence of the British fleet, the situation in European waters has become more stabilised and the risks of the conflagration spreading have been materially reduced. Meanwhile, however, the war in China has brought out vividly the danger of allowing our Navy to fall below the standard of strength which is vitally necessary if we are to fulfil our world-wide responsibilities. The combination of these two crises has made it patent that to-day our Fleet is not strong enough to ensure, at one and the same time, peace and security in home waters and the safety of the outposts of our Eastern Empire if they were attacked, without the active support of other Naval Powers.

It is outside the scope of this chapter to deal with international relations or major strategy, but both pivot more than ever on fleets in being and building. It is of the highest importance, therefore, to take stock of the progress which is being made by foreign navies in comparison with our own, in order that our diplomacy may be modelled on a realistic basis.

There is nothing very new to say about material progress in foreign navies beyond the summary given in the introduction to this chapter last year. Economy of weight combined with efficiency in ship construction and in propelling machinery are enabling the balance of displacement to be devoted to increased offensive and defensive qualities in new warships. In all the heavier classes, speed has asserted its claims strongly as against those of gun-power, armour, and watertight subdivisions ; yet the increasing influence of aircraft on naval design makes it essential that ability to counter and withstand their attacks should not be ignored. It is of particular interest, therefore, to study the designs of foreign men-of-war and see the importance attached to these different requirements by the various Powers and how they are met.

The so-called destroyer is approaching more and more in dimensions and fighting-power what before the Great War would have been called a light cruiser. Foreign submarine flotillas multiply exceedingly and may again be our greatest menace.

The navies of the world are increasing and increasing, while governments continue to protest loudly that they are not building



THE FRENCH BATTLE-CRUISER DUNKERQUE.

Present at the Coronation Review at Spithead, May 20, 1937.

(By courtesy of the French Ministry of Marine.)

for aggression but only for self-defence. Yet, as things go, it is difficult to see where and how a " balance of power " is to be struck which will bring a sense of security to each and all of them.

UNITED STATES.

The new Chief of Naval Operations, Admiral William Leahy, who took office in January, 1937, has gone a step further than his predecessor, Admiral Standley, in making it clear that the Navy Department is no longer wedded to the principle of " parity " in naval strength with Britain to the last detail. Admiral Standley before he retired said : " I don't know that we are going to attempt to reach parity in every small type of ship with the British Navy. We could hardly justify that, and never have." Last summer Admiral Leahy said : " The United States have no intention of competing with the naval programme instituted by Great Britain " ; they would complete their plan for building up to the full limits of the now defunct Washington and 1930 London Treaties, and would maintain that standard. It seems to be clear at last to the professional and better-informed political authorities in the United States that there can never be exact " parity " between the logical requirements of the two countries, and that an increase of the British Fleet, far from being even a remotely potential danger to America, is in reality an addition to the safeguards of the peace of the world. On our side, too, we no longer feel that when the United States adapt their building programme to meet developments on the other side of the Pacific, that they are also keeping a jealous eye on our own side of the Atlantic.

That the President has in mind such adaptation was shown by his letter sent to the Chairman of the Appropriations Committee of the House of Representatives at the end of December. In this he intimated that in view of " world events " it was possible that he would feel it necessary to send Supplementary Estimates to Congress to provide for naval construction in excess of the two battleships, two light cruisers, eight destroyers, and six submarines included in the existing appropriations for the fiscal year of 1938–39. Although in mentioning his " growing concern " he " did not refer to any specific nation or any specific threat against the United States," his pronouncement follows too closely on the Panay incident for the connection not to be obvious.

REORGANISATION OF THE FLEET.

As from October 1, 1937, the United States Fleet was reorganised " with the object of providing the utmost battle efficiency and striking power." Previously it was organised to a large extent from an administrative point of view. Under the new system it is still divided into two main forces—the Battle Force and the Scouting Force, both based on Pacific ports ; and there is also the Base Force consisting of the Fleet train, tugs, and miscellaneous craft. But all the destroyers formerly attached to the Scouting Force have now been transferred to the Battle Force. This now consists of twelve battleships, nine 7,500-ton cruisers, and forty-two destroyers. Seventeen patrol aircraft squadrons have been transferred from the Base Force and have replaced the destroyers in the Scouting Force. The latter now consists of the battleships Arkansas, Texas, and Wyoming; sixteen 10,000-ton cruisers; the aircraft squadron; a number of aircraft tenders; together with the Fleet Air Bases—Coco Solo, Canal Zone, and Pearl Harbour.

BATTLESHIPS.

In March, 1937, Japan formally rejected the British proposal to subscribe to the 14-in. limitation for battleship guns, provisionally accepted by the three Powers who were parties to the London Treaty of 1936. In consequence, the United States Embassy in London informed the Foreign Office, on July 12, that in view of the absence of universal acceptance by the "Washington" Powers of the limitation of gun calibre to 14 in. the United States Government had reluctantly found themselves obliged to mount 16-in. guns in their two new capital ships, the Washington and North Carolina.

Tenders were called for from private yards for the construction of these ships, but they proved to be so high that the vessels are being constructed in Navy Yards. There has been some delay in laying them down, probably due to the slips on which they are to be built having to be lengthened and strengthened; but the keel of the North Carolina was laid in the Brooklyn Navy Yard on October 27, and the Washington was due to be laid down in the Philadelphia Yard early in 1938. Great Britain, by contrast, has five new battleships on the stocks—two of them well advanced towards the launching stage. According to reliable reports, the nine 16-in. armaments of the United States ships will be mounted in three triple turrets—two forward and one aft. It is believed that they will have a secondary armament of sixteen 5-in. in twin turrets. In spite of new-design high-pressure boilers, their speed will be comparatively low as compared with their contemporaries in other navies, and is not expected to exceed 26 or 27 knots. Mr. Swanson, Secretary of the Navy, in announcing this decision, said that the ships were being provided with heavy armour and guns—they were building battleships, not armoured cruisers, he said.

Presumably the two further battleships projected for the 1938–39 fiscal year will be of the same class. It is anticipated that these ships will cost $60,000,000 each, and the first two should be completed by 1941, the second pair in 1942. The four ships will replace the Arkansas, New York, Texas, and Nevada. With the three "West Virginia" class, they will bring the number of 16-in. gun battleships in the United States Navy up to seven, as compared with our two "Nelsons." This does not by any means imply that the British battle fleet, as it will then be constituted, will necessarily be deficient in fighting qualities: on a displacement limited by the London Treaty (1936) to 35,000 tons, an increased calibre of gun means that unless the number of guns is to be disproportionately reduced, there must be a very appreciable increase in the percentage of total weight to be devoted to the armament; this, in turn, implies making sacrifices in armour, speed, or underwater protection—all vital attributes to a ship which essentially exists to fill an offensive role.

AIRCRAFT CARRIERS.

The Yorktown started her trials in the late summer of 1937, but trouble was experienced with excessive vibration and noise, defects which the builders—the Newport News Shipbuilding and Dry Dock Co.—corrected before the ship was accepted. Alterations to overcome these troubles may also be necessary to the sister-ship, the Enterprise, which the same yard is building. The Enterprise is normally due for completion in May, 1938. These two ships, with the Ranger, will form Division 2 of the aircraft carrier organisation.

The third and latest carrier, the Wasp, laid down in April, 1936, is due to complete at the Bethlehem S.B. Corporation, Fore River, in the autumn of 1938. With the commissioning of this ship the United States Navy will have six carriers, excluding the old converted collier Langley which has been adapted to a seaplane tender auxiliary.

CRUISERS.

The last 8-in. cruiser, the Wichita, building in the Philadelphia Navy Yard, was launched on November 16, 1937, and is due for completion in 1938. She will make up the United States quota of eighteen of these ships. Her sister ship, the Vincennes, was commissioned in February, 1937.

Of the nine 10,000-ton cruisers armed with 6-in. guns, the Philadelphia and Brooklyn were completed in September, 1937; the Savannah, Nashville, Phœnix, Boise, and Honolulu are due in 1938; and the St. Louis and Helena in 1939. These ships, if they truly conform to their specified displacement, are remarkable productions. They carry fifteen 6-in. guns, mounted in triple turrets—two forward and two aft; also eight 5·5-in. A.A. guns in pairs, and a number of machine guns. Their torpedo armament consists of two 21-in. quadruple tubes. Last, but by no means least, they can carry six aircraft. With all this top-hamper they have a 5-in. armoured belt and a 3-in. protective deck and their estimated speed is 34–35 knots.

The two light cruisers which form part of the new construction programme will presumably be of the 10,000-ton, 6-in. gun "Brooklyn" class, but no details have yet been announced as to their design.

LEADERS AND DESTROYERS.

The eight destroyers budgeted for in the 1937–38 Programme are four less than was anticipated; but the Navy Department has a good number of new torpedo craft in various stages of construction. Of the thirteen 1,850-ton flotilla leaders of the "Porter" class, five were completed in 1936 and three in 1937; four more are due to commission in 1938 and the last in 1939. The ten "Craven" class and the two "Dunlaps"—1,500-ton destroyers of the 1934 programme—were all completed during 1937. Twelve similar destroyers of the 1935 "Maury" class and most of the twenty 1936–37 "Sims" class are on the stocks.

According to a Press report, four of the new destroyers betrayed a certain amount of structural weakness when they encountered unusually rough weather on their "shake-down" cruises, and certain alterations are being made in the design.

SUBMARINES.

The latest construction programme provides for six submarines to be laid down during the fiscal year 1938–39. The four belonging to the 1937–38 Programme have been given the names Seadragon, Sealion, Searaven, and Seawolf. The first two are being built by the Electric Boat Co., and the two latter in Portsmouth Navy Yard. The Seadragon is due to complete in the summer of 1939, the remainder in 1940. These four are part of the ten "Sargo" class; the remaining six were laid down in 1937. Five of the six "Salmon" class were launched during the year, and all the "Perch" class were completed.

NAVAL AIR SERVICE.

The 1937–38 budget for Naval Aviation amounted to $49,500,000—$9,500,000 more than the previous year. This allows for 397 new aircraft, of which 293 will be for replacement. The United States Navy, according to the Chief of the Bureau of Aeronautics, should have 1,870 aircraft by July 1, 1938, and 2,050 by 1941.

A system of training Aviation Cadets has been in force since 1935, and was instituted in order to provide the large number of pilots required in connection with the expansion of the Naval Air Service and also to build up a good flying reserve. These Cadets, when qualified, rank between Warrant Officers and Ensigns, but they are entered as Seamen 2nd class in the Volunteer Reserve. They first go through a month's elimination flying training at one of the Naval Reserve Aviation Bases; those who survive this test become Aviation Cadets and go to Pensacola for a year's pilots' course. Naval "indoctrinal" training is given in destroyers and other craft. On passing out, the Cadets go to the fleet for three years' aviation duty, at the end of which time they revert to civil life with the rank of Ensign and a gratuity of £300.

PERSONNEL.

A number of changes in Flag Commands took place on June 8, 1937. Rear-Admiral Joseph K. Taussig took over command of the Cruisers, Scouting Force. Rear-Admiral James O. Richardson, who had been commanding the destroyers of the Scouting Force, exchanged duties with Rear-Admiral William S. Pye, Assistant Chief of Naval Operations. Rear-Admiral Walter S. Anderson, lately Naval Attaché in London, became Commander of Cruisers, Division 4, Scouting Forces. Later in the year Rear-Admiral William R. Furlong was appointed Chief of the Bureau of Ordnance in succession to Rear-Admiral Harold R. Stark, who has assumed command of Cruiser Division 3, Battle Force.

Further changes due to take place early in 1938 include the relief of Admiral Arthur J. Hepburn by Admiral Claude B. Bloch as Commander-in-Chief of the U.S. Fleet. Vice-Admiral Edward C. Kalbfus succeeds Admiral Bloch as Commander, Battle Force, assuming the rank of Admiral on taking up the appointment; he is relieved as Commander, Battleships, Battle Force, by Rear-Admiral John W. Greenslade, who becomes a Vice-Admiral. Rear-Admiral Ernest J. King becomes Commander Aircraft, Battle Force, and is relieved by Rear-Admiral Charles A. Blakely as Commander, Aircraft, Scouting Force; both officers became Vice-Admirals on taking up their new commands.

A gradual increase is being made in the Naval Reserve, which will ultimately provide 300,000 trained officers and enlisted men to supplement the personnel of the Fleet in time of war. The present reserves consist of 1,200 officers and 24,000 enlisted men of the Fleet Naval Reserve; 3,400 officers (and no men) of the Merchant Marine Naval Reserve; and 2,300 officers and 10,000 men of the Volunteer Naval Reserve; making a total of about 7,000 officers and 34,000 enlisted men. The new scheme is designed to attract boys of high-school and college age, and they will receive a month or six weeks' training during the summer without pay but with all expenses paid.

FLEET MANŒUVRES.

The Commander-in-Chief of the United States Fleet has announced that the 1938 naval manœuvres will be held in March. They will take place in the California–Hawaii–Aleutian Islands triangle, but operations will be mostly on the Hawaiian–California axis instead of to the west of the Hawaiian Islands, as in 1937.

JAPAN.

The Minister of Marine early in 1937 stated that no naval armament programme that might menace other countries was contemplated. Perhaps this statement should be accepted with some reserve as to what constitutes a menace and what " other countries " should be implicitly excluded, especially in the light of recent events in China.

The principal allocations in a five-year programme are: £47,000,000 for new construction; £8,000,000 for new guns and other equipment; £4,800,000 for " additional land and water equipment "; £4,200,000 towards the development of the Naval Air Force. About one sixth of the total sum is included in the 1937–38 Estimates, which amount to £38,000,000.

An interesting aspect of Japan's preparedness for war was touched on in a statement by the Navy Minister to the House of Representatives that there was sufficient oil available to see the fleet through a protracted war. This was made in connection with a government bill to establish the Imperial Fuel Industry Company and the regulation of the production of synthetic liquid fuels. The Commerce and Industry Minister said that the government would subsidise the manufacture of synthetic gasoline and oils to the extent of 95,000,000 yen in the ensuing seven years. By that time he hoped their cost would be about the same as the natural products.

Another factor in war readiness—the supply of raw materials—forms the subject of an agreement between the Navy and Army Departments to exercise as great control as possible to prevent unusual and sudden rises of prices. The two Services also cooperate in regard to placing orders, enlargement of plants, and technical supervision of products.

ORGANISATION OF THE FLEET.

It is interesting to compare the organisation of the Japanese Fleet, as announced by the Admiralty in Tokyo, with the re-organisation of the United States fleet. The former is as follows :—

Combined Squadron.

1st Battleship Division	Nagato, Mutsu, Hyuga.
3rd „ „	Haruna, Kirishima.
1st Destroyer Flotilla	Kiso and 9th and 2nd Squadrons.
1st Submarine Flotilla	Isudzu and 7th and 8th Squadrons.
1st Air Division	Hosho, Ryújo, and 30th Destroyer Squadron.

Second Squadron.

4th Cruiser Squadron	Takao, Maya.
5th „ „	Nachi, Haguro, Ashigara.
2nd Destroyer Flotilla	Jintsu and 7th, 8th, and 19th Squadrons.
2nd Submarine Flotilla	Sendai and 12th, 29th, and 30th Squadrons.
2nd Air Division	Kaga and 22nd Destroyer Squadron.
12th Division	Okinosima, Kamoi, and 28th Destroyer Squadron.

Third Squadron.

10th Cruiser Division	Idumo, Tenryu, Tatsuta.
11th Division	8 gunboats and 3 destroyers.
5th Destroyer Flotilla	Yubari and 13th and 16th Destroyer Squadrons.
School Division	Yakumo, Iwate.

BATTLESHIPS.

Sensational reports which have appeared that Japan intends to build battleships of 40,000 to 50,000 tons armed with 18-in. or even 20-in. guns have been officially denied by Admiral Youai, Minister of Marine, and there is no reason to believe that the armament of the new ships will exceed 16 in. The delay in laying down the first two of the four projected ships may well have been due to a similar delay in laying down the new American battleships—the respective naval authorities each waiting to see what design the other was going to adopt.

Meanwhile all the existing battleships—and one-time battle-cruisers now classified as battleships—have been modernised. The chief alterations are that they are now all fitted to burn oil fuel only; the boilers and propelling machinery have been renewed; the elevation of the turret guns has been increased; the anti-aircraft defences have been improved; and the fire control systems have been brought up to date. On completing her modernisation the Mutsu replaced the Nagato as flagship of Admiral Osam Nagano commanding the combined fleets.

AIRCRAFT CARRIERS.

The 10,050-ton carrier Hiryu was laid down at Yokosuka on August 7, 1936. She will be a sister ship to the Soryu, laid down in 1934 and now completing at Kure. A third ship, the Koryu, is believed to be projected for 1938.

The 10,000-ton aircraft transport Chitose is building at Kure, and the Chiyoda and Miduho at Maizuru.

CRUISERS.

Provision is believed to have been made for an unknown number of cruisers in the Third Replacement Programme. But at the end of 1937 Japan had only two cruisers building—the " B " Sub-Category ships Tone and Tikuma. The former, laid down in 1934, should complete during 1938; the latter, laid down in 1935, will not be ready to join the fleet before the following year at earliest.

DESTROYERS.

The latest type of destroyer is another example of the very heavy armaments which Japan is mounting in her lighter ships on ostensibly small tonnage. The " Oshio " class on a reputed displacement of 1,500 tons will carry six 5-in. guns—one more than the earlier class of 1,368 tons—also eight 21-in. torpedo tubes. Their hulls are 365 ft. long and 37 ft. beam; the draught is 9 ft.; and the designed full speed is 34 knots.

SUBMARINES.

The submarine flotilla is now officially classified in four categories—the Cruiser class, which includes the " Ocean " units of 1,950 tons, carrying two 5·5-in. guns and six torpedo tubes; the Mine-laying class, of 1,400 tons with one 5·5-in. gun and four torpedo tubes, besides mines; the High-seas class, of 1,400 tons, one 4-in. gun, and six torpedo tubes; and the Coastal class, of under 1,000 tons, carrying one 3-in. gun and four tubes.

According to an American report, Japan had fifteen Cruiser and four High-seas submarines and one Coastal class under construction in 1937. When these are complete she will have a total of twenty-one Cruiser, twenty-five High-seas, four Mine-layer, and twenty-three Coastal submarines.

There is also reported to be in existence a fifth class, known as the "pocket type," some reference to which was made in the 1935 "Brassey"; but few details have been published of these craft.

SINO-JAPANESE WAR.

According to a Shanghai report, thirty-two cruisers and destroyers and about thirty-three gunboats were engaged in the operations in that vicinity last autumn. The coast-defence ship Idumo has been acting as flagship and was the target for an unsuccessful attack by Chinese motor torpedo boats. Other heavy ships were the cruisers Sendai, Natori, Kitakami, and Yura. The aircraft carriers Kaga, Hosho, and Ryujo and the aircraft tender Kamoi disembarked their aeroplanes while anchored off the mouth of the Yangtse.

FRANCE.

France has duly ratified the 1936 London Naval Treaty, and will therefore not build battleships exceeding 35,000 tons or arm them with guns greater than 16-in. and her new cruisers will not exceed 8,000 tons or mount guns greater than 6·1-in.

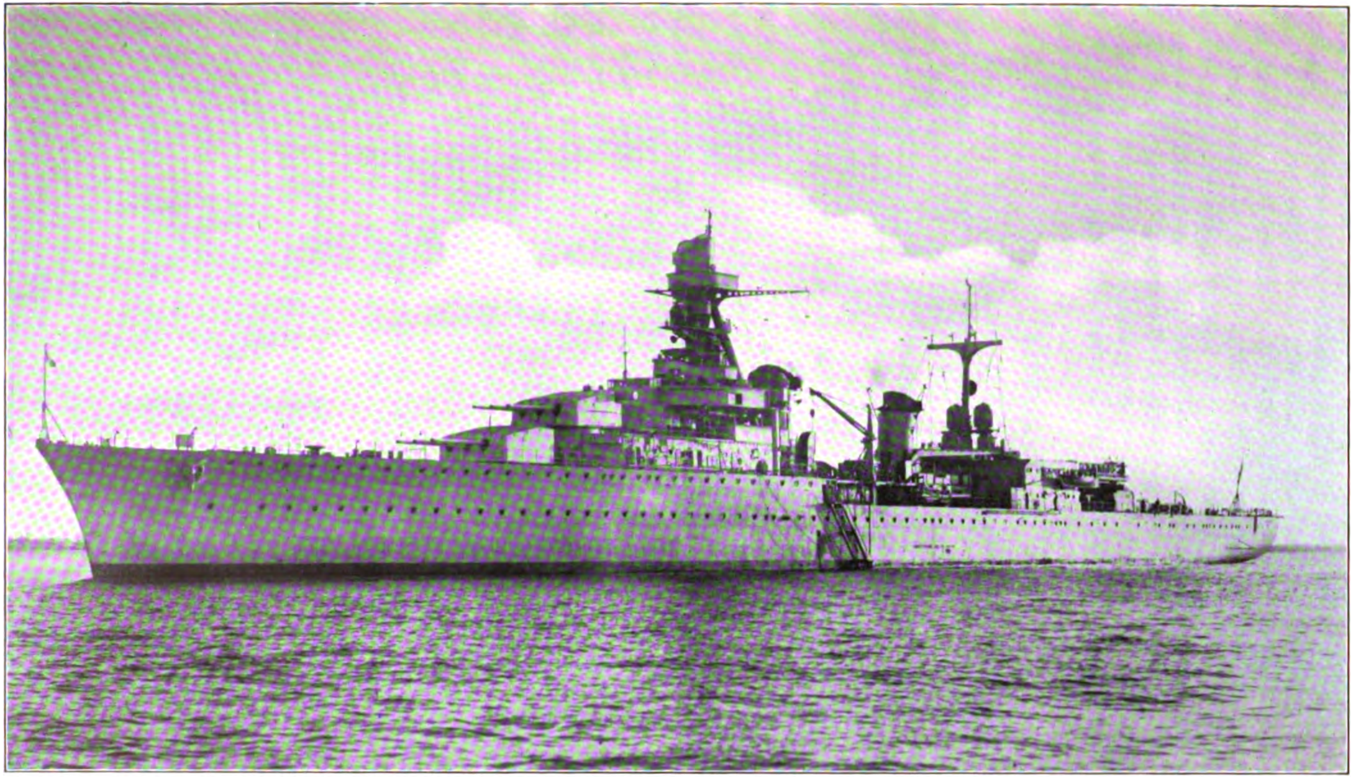
The 1937 Programme of construction was as follows:—

One 8,000-ton cruiser to be called De Grasse.
Two 1,850-ton destroyers—L'Agile and Le Corsaire.
Four 1,000-ton destroyers—Le Farouche, Le Fier, Le Filibustier, and L'Entreprenant.
Three 1,500-ton submarines—La Bajadere, La Creole, La Favorite.
Four small submarines—L'Africaine, La Praya, Emeraude, and one other.
Two colonial sloops—Beautemps-Beaupré and Ville d'Ys.
The smaller craft will include twenty-eight minesweepers and submarine chasers, four aircraft tenders, and an oiler.

There was a projected supplementary programme which the Minister of Marine put forward "to counterbalance the recent increased programmes of other nations." This would make provision for three additional 35,000-ton battleships—making five in all—and ten 8,000-ton cruisers, all to be completed by 1943. But it is understood that at present there is no question of a long-term programme being adopted.

The standard 1938 Programme includes two aircraft carriers; another 8,000-ton cruiser; three destroyers of 1,172 tons, three of 1,000 tons (classified as torpedo boats); and four 800-ton submarines.

There are numerous indications that naval construction in France is being severely hampered by the socialistic legislation of recent years and by frequent strikes. The introduction of a 40-hour week puts her at a great disadvantage by comparison



THE FRENCH CRUISER MARSEILLAISE.

Completed for Service, 1937.

(By courtesy of the French Ministry of Marine.)

with the strenuous building in the two neighbouring totalitarian States. In connection with the launch of the battleship Strasbourg, the *Figaro* remarked that she was already three months late on the original date owing to strikes, and that by contrast with the reduced hours in French yards, German yards were working in three shifts of eight hours—the equivalent to a 144-hour week. According to another report in the French Press, it is estimated that new construction will be retarded by at least a year.

Owing to the restrictions on working hours and to the rise in the prices of raw materials, the cost of shipbuilding has greatly increased.

BATTLESHIPS.

Work on the first two 35,000-ton battleships Richelieu and Jean Bart appears to be progressing very slowly. The former was laid down in October, 1935; at the end of nearly two years it was reported that her construction had only advanced as far as the second armoured deck. These ships will have the same main armament as our "Royal Sovereign" class, i.e. eight 15-in. guns, but they will be mounted in two quadruple turrets superimposed forward. The secondary armament will consist of sixteen 6-in. guns, mounted in five triple turrets (three aft and two amidships); twelve 3·9-in. A.A. guns, mounted in pairs amidships; and eight 37-mm. A.A. weapons. They will be exceptionally well armoured—9–16-in. belt, and 8-in. upper and lower armoured decks. The designed full speed is 30 knots.

The 26,500-ton Strasbourg was due for completion before the end of 1938; but it is very unlikely that she will be ready to join the fleet before the following year. It is not clear why this ship was classified as a battle cruiser in the Official Return of Fleets for 1937; with an armament of eight 13-in. and sixteen 5·1-in. guns, and 40 per cent. of her displacement devoted to armour she is well worthy of being rated a battleship. Her anticipated full speed of 32 knots is comparable with that of many modern battleship designs.

The Dunkerque represented the French navy at the Coronation Review in May, 1937, but was then not actually complete in all respects.

The old battleship Diderot was sold at Brest in July last for 3,557,010 francs to the firm of Gosselin-Duriez and is being broken up. A sister ship, the Ocean—*ex* Jean Bart, has been reduced to a hulk. The remaining two ships of the class, the Courbet and Paris, are maintained as sea-going gunnery and torpedo training ships respectively. A fifth ship, the France, foundered after striking an uncharted rock in Quiberon Bay in 1922.

AIRCRAFT CARRIERS.

Two 15,000-ton carriers are projected for the 1938 Programme, but no official details of their design are yet available. According to an unofficial report these ships are to be armed with 5·1-in. guns and will have a speed of 32 knots.

CRUISERS.

As 8-in. guns are now forbidden for the new ships of the three nations who are parties to the 1936 Naval Treaty, the two new 8,000-ton cruisers will no doubt be improved La " Galissonnière " class, with a 6-in. armament. The latter are remarkable ships, not only for the high speed they have developed on trials but also on account of the armour protection with which they have been provided ; the turrets have 5½-in. faces—said to be capable of keeping out 6-in. shells ; and for nearly 400 feet of length there is a 3–4¾-in. belt with a 1½-in. deck. A rather unsightly deck-crane right aft is indispensable for hoisting in aircraft which land on the towed Hein mat, which is housed in the stern and paid out through a long aperture running from quarter to quarter. The hangar for four aeroplanes is immediately abaft the mainmast instead of being abreast the fore funnel, as in our " Southamptons."

The three last ships of the class, the Georges-Leygues, Gloire, and Montcalm, form a Fourth Cruiser Division of the Atlantic Squadron. They were due to carry out an endurance cruise round Africa in the early months of 1938.

LESSER CLASSES.

The Mogador, sister ship to the Volta, was launched at Lorient on June 9, 1937. Details of these vessels were given in last year's " Brassey." It is reported that the new-pattern 5·5-in. guns with which they are armed have shown a very satisfactory rate of fire, sixteen rounds per minute having been attained on trials. They have semi-automatic breech mechanism and the maximum range is believed to be 25,000 yards.

The twelve craft of the " Bombardi " class, previously known as *Escorteurs*, are now classified by the Ministry of Marine as *Torpilleurs*, the idea being that the former title implied an unduly restricted function which is not justified. The vessels are, in fact, torpedo boats of 700 tons full load displacement, armed with two 3·9-in. guns and four 15·7-in. torpedo tubes. The designed full speed is 34·5 knots.

HIGHER COMMAND.

In the early part of 1937 the High Naval Command for peace and war was reorganised as follows. The Vice-Admiral, Chief of the Naval Staff in peace-time—who is also Vice-President of the *Conseil Superieur de la Marine*—will on mobilisation become Commander-in-Chief of the Naval Forces. The Vice-Admirals who in peace-time are Inspectors-General of the Naval Forces become Commanders-in-Chief of the fleets in war. Sea-going commands take their orders direct from the Minister of Marine in peace-time ; in war they would receive them from their Commander-in-Chief or from a Commander-in-Chief nominated by him.

This appears to be a system which might lead to a most dangerous change of authority and command at the critical period of the outbreak of hostilities. In some respects it appears to follow the bad example set by the British General Staff in 1914, when the higher officers left the War Office and went to France to take over supreme command of the Army in the field. Possibly it is intended that the Commander-in-Chief of the French Naval Forces shall continue to perform the duties of Chief of the Naval Staff, but that he shall have more executive authority in co-ordinating their disposition and movements in war than he has in peace. If so, his war title is somewhat of a misnomer from the traditional point of view that a naval Commander-in-Chief should lead the fleet to sea.

NEW NAVAL BASE.

A new naval base which, according to the Minister of Marine, is to be " one of the finest on the Mediterranean," is being developed at Mers-el-Kebir, on the Bay of Oran, Algeria. Strategically the base may be regarded as one of the points of a triangle, the other two being Bizerta and Toulon, linking up France with North Africa—a vital source of man-power in war.

It is estimated that the new base will cost about 275,000,000 francs.

GERMANY.

Germany signed a bilateral treaty with Britain in July last. This, in effect, secures her adherence to the terms of the 1936 London Naval Treaty as regards qualitative restrictions. She is conforming conscientiously to the quantitative restrictions to which she agreed in the bilateral pact with Britain of June, 1935, and is building steadily to increase her fleet up to that standard. According to a reliable report, there is to be no change which would affect the total tonnage to be completed by 1941. By that year the fleet, as planned, will consist of five battleships, three armoured ships of the " Deutschland " class, two aircraft carriers, fourteen cruisers, forty destroyers and torpedo boats, and about 23,000 tons of submarines.

BATTLESHIPS.

The first two 35,000-ton battleships are building at Hamburg and Wilhelmshaven. It is understood that they will have a main armament of eight 15-in. guns, a secondary armament of twelve 5·9-in. guns, and a speed of at least 30 knots. A third ship is projected for 1938 and will be built at Kiel.

The two 26,000-ton battleships (classified in the Admiralty List as battle-cruisers) Scharnhorst and Gneisenau have both been afloat for over a year. Some details of these ships were published in last year's " Brassey." They are due for completion in the early months of 1938.

In spite of the great success and many advantages claimed for the Diesel propelling machinery of the " Deutschlands," steam machinery is being installed in the new battleships—a clear indication that the latter still has inherent advantages over heavy-oil engines for bigger warships. This certainly is the view which governs the policy adopted in our own naval construction. In the Scharnhorst and Gneisenau auxiliary Diesels are fitted for cruising.

It is reported that a fourth entrance is being constructed at Wilhelmshaven. This will be north of the existing entrances and, it is understood, will take the form of a new lock capable of accommodating the 35,000-ton battleships.

The armoured ship Deutschland was bombed on May 29, by Spanish government aircraft. An official statement, based on reports from Rear-Admiral Fischel, said that the aeroplanes attacked about 7 p.m. from the direction of the setting sun, and their type and markings could not be observed. The Deutschland had no reason to treat the aircraft as enemies until bombs were dropped, and fire was not opened either by her or by the destroyer Leopard, which was in company—the two ships were anchored off Iveza, in the Balearic Islands.

Two bombs hit the ship; one burst on the mess deck, killing thirty-one of the crew and injuring many more; the other hit the shield of a 5·9-in. gun abreast the funnel on the starboard side, a fragment pierced a petrol tank causing a fire which took some time to put out. The numbers of casualties is accounted for by the fact that a large proportion of the crew was off duty and in the unprotected living-quarters in the fore-part of the ship. No vital damage was caused to the Deutschland, which proceeded to Gibraltar under her own steam to land her dead and injured.

Two days later a sister ship, the Admiral Scheer, and two destroyers took reprisals for this unprovoked assault by bombarding the government base port of Almeria for nearly an hour, causing many casualties and damaging the harbour works. The German government subsequently announced that with the infliction of this bombardment " the act of retaliation was terminated."

AIRCRAFT CARRIERS.

It is reported that the two aircraft carriers building for the German Navy will be well protected, even at the expense of a reduction in the number of aeroplanes to be carried, which will only be about twenty-five. Their main armament will be heavy—fourteen 5·9-in.—the mountings being of a general purpose type which will enable the guns to be used as A.A. weapons as well as against surface targets. Both ships were laid down in 1936. Their standard displacement will be 19,250 tons.

CRUISERS.

The 10,000-ton cruiser Blücher laid down at Kiel in 1935 and her sister ship the Admiral Hipper laid down in the same year at Hamburg are expected to be in commission before the end of 1938.

The Blücher was launched by Frau Erdmann, widow of the Captain of the Blücher sunk in the Dogger Bank action, on 8th June last. The Admiral Hipper was launched on February 6, 1937, by Frau Raeder, wife of the Navy Minister—Admiral General

Erich Raeder, who was navigating officer to Admiral Hipper during the Great War.

A third ship of the class, known as " I," was laid down at the Germaina Yard in 1936 and is due to be launched in 1938. Cruisers " K " and " L " were laid down by Blohm and Voss, and Deutsche Werke respectively in 1937. They will displace 10,000 tons and be armed with 5·9-in. guns. Two 7,000-ton ships to be armed with 5·9-in. guns are projected to be laid down early in 1938.

DESTROYERS.

Names have been allotted to the sixteen destroyers, Z1–Z16, of the 1934 Programme. The first to be commissioned, Z1, has been called Leberecht Maass after the Admiral who went down in the light cruiser Köln in the battle of the Heligoland Bight, in August, 1914 ; she is fitted as a leader. Z8 and Z9 are named Bruno Heinemann and Wolfgang Zenker, after two naval Captains who were killed on board their ships at Kiel on November 5, 1918, in the mutiny which began the German revolution and virtually marked the end of the War. Z10 is given the name Hans Lody, after the naval lieutenant who was convicted as a spy and shot at the Tower of London in November, 1914. Six other destroyers are named after naval officers who lost their lives on service in 1914 and 1915. All these ships are of 1,625 tons displacement, armed with five 5-in. guns and eight 21-in. (quadruple) torpedo tubes. They have a designed speed of 36 knots. The first was commissioned in January, 1937 ; since then at least nine have joined the Fleet. It is reported that these destroyers have given very satisfactory results on trials and that they stand up well to rough seas.

The new class, Z17 to Z22, laid down in 1936, will be larger craft with a displacement of 1,811 tons. They will be armed with at least six 5-in. guns and eight torpedo tubes. Their designed speed will be 36 knots.

SUBMARINES.

According to an official statement made early last year (1937), the following are some of the principal details of German submarines : the twenty-four 250-ton craft, U1 to U24, are armed with three torpedo tubes and one machine gun, they have a crew of twenty-five ; the armament of the two 712-ton submarines U25 and U26 is six torpedo tubes, one 4·2-in. gun, and the complement forty men ; the ten 500-ton class, U27 to U36, have five tubes, one 3·7-in. gun, and a crew of thirty-five.

A new type of engine is said to have been installed in some of these submarines. Instead of the usual propelling machinery consisting of Diesel engines for use on the surface and electrical motors when submerged, it takes the form of a hydrogen and oxygen motor. It is claimed that this has several advantages ; reduced weight, flexibility, high efficiency, large reserve of power, increased radius of action, simplicity in operation, upkeep, and training. With this system a submarine does not have to " surface " to recharge batteries, and can remain under water for a much greater length of time. In emergency the hydrogen can be retained or employed to empty the tanks without calling on the oxygen supply required for respiration. The danger of sea-water getting into the large batteries required for electric propulsion is also eliminated.

PERSONNEL.

Vice-Admiral Saalwächter, Inspector of Training, and Vice-Admiral Carls, Commander-in-Chief of the Fleet, were promoted to the rank of Admiral in May last; the latter thereby passes over the head of three senior Vice-Admirals.

New Flag appointments made during 1937 include that of Vice-Admiral Böhm as Admiral Commanding North Sea Naval Station and Rear-Admiral Densch as Commander-in-Chief, Scouting Forces.

Rear-Admiral Erwin Wassner, the first German Naval Attaché in London since the War, who had held that appointment since 1933, died suddenly from heart failure on August 25 last. During the War he was a successful submarine commander, and for his services was awarded the highest German war decoration " Pour le Merite." He has been succeeded by Kapitan-zur-See Siemens.

A Leutnant z. See now does about one and a half years in that rank, an Oberleutnant four years, and a Kapitan Leutnant four years, as compared with four, seven, and seven years respectively in 1916.

A third sailing training ship, named the Leo Schlageter after Albert Leo Schlageter, who was shot by the French in 1923 for sabotage in the Ruhr, was launched at Hamburg on October 30 last.

ITALY.

The navy estimates for the year ending June 30, 1938, amount to 1,857,891,000 lire (about £20,000,000). This is an increase of 248,000,000 lire on those for 1936–37. In his accompanying report Signor Cao di San Marco said that Italy had never sought an armaments race, but had merely developed her naval forces in relation to those of other Powers. Her programmes had also to meet requirements arising out of the development of existing or the creation of new land bases. He referred to the British search for a site for a new naval base in the Eastern Mediterranean and to the possibilities of strengthening the " precarious " Italian bases on the Red Sea and the Indian Ocean.

In the spring of 1937 a decree was published under which the government took over all shipyards and shipbuilding companies with a capital of or above 100,000,000 lire. This is understood to be a first step towards the abolition of all private enterprises in national defence industries which sell directly to the State. In March last Signor Mussolini had already foreshadowed this policy when he alluded to " the inevitability that the nation will be called to the trial of war," and gave an assurance that " the sad phenomenon of war profiteering " would never be repeated in Italy. The decree affected three of the principal shipbuilding companies. Compensation is made to the shareholders on the basis of average stock quotations for the last six months. In the case of smaller companies, who may be similarly taken over and whose shares are not quoted, they will probably have to submit to an arbitrary valuation.

BATTLESHIPS.

The 35,000-ton battleship Vittorio Veneto was launched on July 25 last at Trieste. The naming ceremony was performed in the presence of the King and Queen of Italy by the wife of a dockyard worker who had been awarded a medal for meritorious work. The sister ship Littorio was launched on August 22 at the works of Ansaldo, Genoa. The King and Queen of Italy and a distinguished gathering were also present at this event, which was staged as a climax to the naval manœuvres in Sicilian waters. Both ships were laid down in October, 1934; but work on them was held up during the Abyssinian crisis, when efforts were concentrated on accelerating the construction of cruisers and lesser craft.

Some details of these two ships were published in this chapter in last year's "Brassey," but later information indicates that they will not be quite as fast as was then anticipated. Instead of the 34 knots with which they were credited, it is now doubted whether their full speed will much exceed 30 knots. Their engines will be of 150,000 h.p. and consist of four groups of turbines. The boilers will be of the high-pressure type and the firing will be all oil. The nine 15-in. guns will be mounted in triple turrets, two forward and one aft, the latter being superimposed. The secondary armament will be twelve 6-in. guns mounted in pairs amidships; and twelve 3·5-in. A.A. guns. The armoured belt will be 9–10 in. Four aircraft are to be carried.

Two more battleships of this class are to be laid down in 1938. They are to be called the Roma and Impero, and will be built at Trieste and Genoa, respectively.

CRUISERS.

The Duca Degli Abruzzi and the Guiseppe Garibaldi were due to join the fleet before the close of 1937. These two ships are really slightly enlarged "Condottieri" class. They carry two extra 6-in. guns (ten in all)—the foremost and aftermost turrets having triple, instead of pair, mountings—and the guns are of a later design, 55 instead of 53 calibre. The first-named ship is reported to have attained 38 knots on her 8-hour trials.

The old cruisers Pisa and Ancona (*ex*-Graudenz), Libia, Brindisi (*ex*-Helgoland), and Venezia (*ex*-Saida) have been removed from the Navy List as being over-age and not worth modernising.

Twelve *esploratori* (scouts)—really small, high-speed cruisers—are to be laid down as soon as possible.

DESTROYERS.

In the course of his statement to the Senate when introducing the Naval Estimates for 1937–38, the Chief of the Naval Staff said that a new division of four large destroyers of the " Oriani " class was almost completed. These craft were part of the 1935 Programme. The Oriani herself was laid down in October, 1935, the other three early in 1936 ; so that they have been less than two years building. On a standard displacement of 1,498 tons (1,850 full load), they carry four 4·7-in., four 37-mm. A.A. guns, and six 21-in. (triple) torpedo tubes. With 48,000 h.p., their designed speed is 39 knots.

Twelve 1,600-ton destroyers and sixteen torpedo boats were laid down during the 1936–37 fiscal year. The former appear to be sizeable vessels of 2,000 tons full load, armed with five 4·7-in. guns and having a designed full speed of 40 knots.

The first of this class, the Camicia Nera (Black Shirt) was launched at Leghorn in August last. Another five are building at that port ; they have been named the Artigliere, Ascaro, Aviere, Corazziere, and Pontiere. Two more are building at each of the shipyards at Ancona, Palermo, and Riva Trigoso respectively.

The new torpedo boats are improved " Spica " class. Eight are building at the Ansaldo yard, Genoa ; and four at each of the shipyards at Genoa and Fiume.

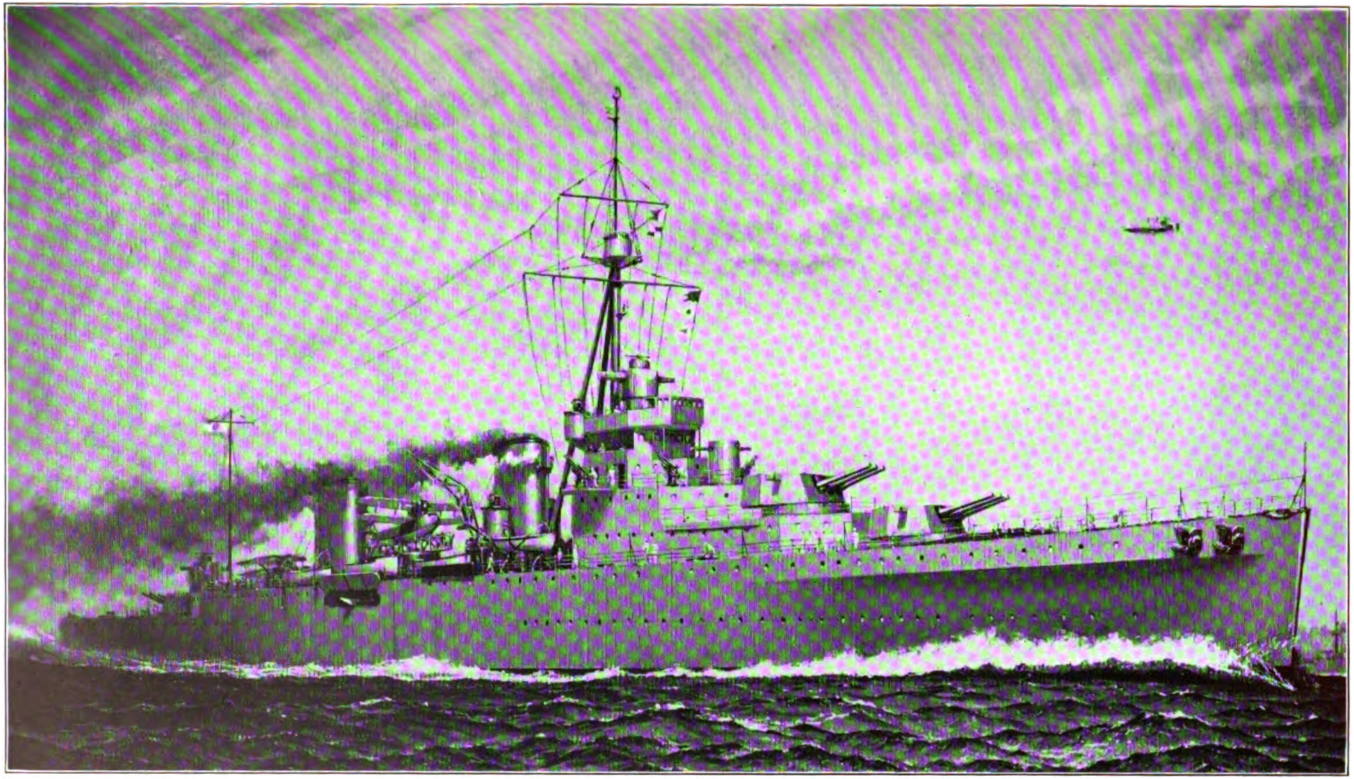
SUBMARINES.

Twenty submarines of over 600 tons displacement were laid down during the 1936–37 financial year. Nine of these are craft of 941 tons under construction at Monfalcone ; three of 896 tons and a minelaying submarine of 1,127 tons (" Foca " class) are building at Taranto ; of the remaining seven, of the " Adua " coastal class displacing 675 tons, five are in hand at Leghorn and two at Taranto.

When these craft are completed, Italy will have 116 submarines, of which more than 40 per cent. will have been built since January 1, 1935. Unless the programmes of other Powers are increased before then, Italy will have more modern submarines than any other country. A further, but unspecified number, of submarines will be laid down as early as possible in 1938.

NAVAL AIR WORK.

At present the Italian Navy is dependent for its air services on a section of the Air Force, but an indication that it may eventually have an air branch of its own was contained in Signor Marco's report on the 1937–38 Estimates. In this, he referred to experiments which are being carried out " to increase the autonomy and possibilities of this branch of aviation." He also said that the " coastal squadrons of the Air Force for the Navy had, in their exercises, paid special heed to navigation at high altitudes and at night, and also to long flights out to sea " ; the material of the ship-borne air force was being renewed.



THE ARGENTINE TRAINING CRUISER LA ARGENTINA.

(*From a painting, reproduced by permission of the Argentine Naval Commission in Europe.*)

In 1937 twelve squadrons of 108 bomber aircraft were organised for co-operation with the navy. They were distributed: four squadrons at Orbettelo, two at Brindisi, three at Leros, and three at Spezia. The aeroplanes were, then, all of the Savoia S.55 type, but they were due to be replaced by Kant Z.506 sea bombers.

The sea reconnaissance organisation, at the same date, consisted of fifteen squadrons of 135 aircraft, based on Sicily, Sardinia, Leros, and other stations on the mainland. In addition, 32 reconnaissance aircraft are embarked in cruisers. These flights were being re-equipped with Romeo R.O. 43 two-seater single floatplanes in place of the Kant 25 single-seater flying-boat type.

The personnel of the striking force is entirely Air Force; there are no naval pilots.

SOVIET UNION.

It is reported that Soviet Government agents have been authorised to purchase naval equipment to the value of 50 million dollars in the United States and that orders to the value of 10 million dollars were placed there in September last. This lends colour to recurring statements that Russia has ordered at least one 35,000-ton battleship to be built either completely in America, or else at home largely with manufactured material from that country. One or two more such ships are mentioned as being projected. It is understood that private firms in the United States were approached during the past year by representatives of the Soviet Union with a view to arranging the manufacture of 16-in. guns; but a condition was that they should be inspected and passed by American officials. As there were difficulties in the way of this being done by United States Navy experts, the negotiations fell through at the time, but other arrangements for the supply of this ordnance from America may have been made since.

It is also reported that two 8,500-ton cruisers, originally laid down as long ago as 1913–14, are now being completed and will be named the Kirov and Voroshilov. Another ship, also laid down at that time as a cruiser, is being completed as the 9,000-ton aircraft carrier Stalin.

Two vessels of 2,900 tons, which can be conveniently classified as flotilla leaders, were completed last year at Leningrad. These are the Leningrad and Minsk. They are armed with five 5·1-in. guns, of which three are on the forecastle deck level, the two forward mountings being superimposed in the orthodox manner and the third being abaft the bridge; also four 37-mm. A.A. guns. The torpedo armament consists of two triple 21-in. tubes. This seems to be a very modest equipment for vessels of such a large displacement. With geared turbines of 70,000 h.p. the designed full speed is 35 knots; but the Leningrad is credited with 36·3 knots on her trials. Six more ships of this class are in various stages of completion; one, curiously enough in view of the relations between the two Powers, is building at Leghorn.

There is every reason to believe that French constructors and engineers are supervising the building of these leaders, and perhaps other warships being constructed or reconstructed in Russia.

From time to time there have appeared in the Press of this and foreign countries somewhat extravagant reports of huge increases being made to the number of torpedo craft, especially submarines, in the Soviet Fleet. Amongst pronouncements to this effect which may be treated more seriously is one made by the German War Minister last year. Basing his views on statements made by Admiral Orlov, Chief of the Soviet Naval Forces, he has expressed his belief that Russia will be the strongest submarine Power in the world and will eventually have 150 submarines. Most of these are believed to be in the Baltic, but a number of a larger " P " class of 2,200 tons are alleged to be in the Far East. A Japanese report states that there are about fifty submarines, ten destroyers, and a number of minelayers at Vladivostok. The authors of these statements cannot, however, be regarded as entirely disinterested ; the figures should therefore be accepted with caution.

Systematic training of naval officers is now given at a Naval College, a Naval Engineering College, a Naval Communications School, and a Coast Defence College. The Naval College prepares officers for admission to the fleet and " preparatory specialisation " in navigation, gunnery, torpedo, mining, and hydrography ; the course lasts four years. The four and a half years at the Engineering College trains officers in naval engineering, electricity, and ship construction. Signal and W/T specialists start training as cadets. The course for a " communications officer " also lasts four and a half years. The Coast Defence School qualifies officers for coast defence artillery and as fleet gunnery specialists ; the course lasts four years. Entrance examinations took place between July 1 and August 1 in 1937. Candidates had to be between 17 and 22 years of age and were required to have had ten years' " middle school " education or corresponding education in factory and technical schools. For some reason a less high standard was required of future artillery officers, as candidates with only nine years' such education could be accepted at the Coast Defence School.

The High Command of the Navy was divorced from that of the Army and Air Force at the end of 1937. A Commissariat of the Naval Fighting Forces of the U.S.S.R. has been created, with Smirnoff as its Chief and having the title of Naval Commissar, and Mekhlis, originally a military Commissar, as his deputy. Previously all three forces were combined under a Commissariat of Defence with Voroschiloff as Chief and Admiral Orloff as deputy for naval matters. The latter, soon after representing the Soviet Union at the Coronation Naval Review, disappeared, together with a number of high naval and military officers. The new Naval Commissar was his deputy and has been a political chief of the Red Army since September. The Soviet Government have also created a General Staff of the Red Navy with Admiral Galler, a former Tsarist naval officer, as Chief of Staff.

Fleet Flagman Victoroff has been relieved by Fleet Flagman Kireff as Commander-in-Chief of the Pacific Fleet.

The battleship Oktober Revolution has replaced the Marat as flagship of the Baltic Fleet. The Marat represented the Soviet fleet at the Coronation Review.

SPAIN.

When the full history of the Spanish Civil War comes to be written, one of the most interesting parts of it will be how sea power passed from the hands of the Madrid Government to Franco, and of all that followed therefrom. Soon after the outbreak of hostilities, the rival forces were as follows :—

	GOVERNMENT.	FRANCO.
Battleships	Jaime I	España
Cruisers, Heavy	Nil.	Canarias * Baleares †
„ Light	Miguel de Cervantes Libertad Mendez Nuñez	Almirante Cervera Navarra (ex-Republica)
Flotilla Leaders	About 12	Nil
Destroyers	3	1
Gunboats	4 (2 very old)	2
Submarines	About 12	1 (plus 3 building)

The Government naval losses up to the end of 1937 have included the battleships Jaime I, which after various adventures was so badly damaged by an internal explosion that she lies at Cartegena in practically a wrecked condition. The flotilla leader Almirante Ferrandiz was sunk in an engagement with the Nationalist cruiser Almirante Cervera, another Government leader, the Gravina, being badly damaged in the same action. The submarine B6 was sunk by the destroyer Valesco. The Miguel de Cervantes was torpedoed while at anchor in Cartegena Bay, probably as a parting shot from the submarine B5 as she was escaping to the Nationalists. The cruiser was badly damaged. The leader Churruca was also torpedoed off that port by an unidentified submarine, and seriously damaged. Both ships were able to get into harbour. The leader José Luis Diez was badly damaged in an engagement with the Canarias. On the fall of Gijon, in October, this vessel and two submarines escaped to French ports, while the flotilla leader Ciscar and several armed trawlers were taken to sea and sunk by their own crews in deep water. The loss of these craft marked the end of the Government's naval activities on the North Coast. The Ciscar was originally intended to take part in the Coronation Review at Spithead; but doubtless was deterred by the risk of falling in with Nationalist forces.

Franco's only serious loss has been the battleship España, which on April 30 struck one of his own mines and sank five miles north of Santander. The report, which was given wide publicity at the time, that she had been sunk by a bombing aircraft proved to be untrue. A Government aeroplane which was in the vicinity apparently did not even notice that the ship was in trouble.

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* The Canarias was incomplete until September, 1936.

† The Baleares was not ready for sea until January, 1937, and then without her after turret.

Apart from the greater losses of ships on the Government's side, their navy appears to have disintegrated internally, for all practical purposes. This is not surprising, as they have followed the example of Soviet Russia and introduced the duplicate system of military authority and political control which, in the case of the Spanish Government naval forces at any rate, has reduced the fleet to a condition of chaos and inaction.

In spite of being greatly hampered by the refusal of the Non-Intervention Powers to grant him belligerent rights, Franco, from being in a position of marked inferiority at sea, now dominates the greater part of the coast of Spain. Were it not for the unprecedented steps which those Powers have agreed to take to exclude outside interference and to prevent the Civil War spreading into a European conflagration, there can be little doubt that the Nationalist navy could now practically exclude sea-borne supplies from reaching Government Spain.

OTHER EUROPEAN COUNTRIES.

DENMARK.

Admiral Rechintzer, Commander-in-Chief and Director-General of the Ministry of Marine, has stated that he considers the most important part Denmark might be called upon to play would be the preservation of her neutrality by closing the Baltic and safeguarding the Kattegat.

A six-year programme of new construction includes three submarines, six torpedo-boats, one minelayer, three minesweepers, three speed-boats, one inspection ship, and one survey ship; and one more submarine is to be laid down before the end of that period. Of the above, three submarines and three minesweepers are building, and three of the torpedo-boats will be laid down in 1938.

The old torpedo-boats Söridderen, Söülven, and Flyvefisken, built in 1911, have been struck off the effective list and are being scrapped.

ESTONIA.

The voluntary subscription fund for naval construction, to which allusion was made in last year's "Brassey," closed in the spring of 1937. It totalled 320,000 E.crowns (approximately £17,800); of this 200,000 E.crowns are to go towards the construction of a new destroyer and 12,000 E.crowns to the armament of a new warship.

The two small submarines Kalev and Lembit, built by Messrs. Vickers-Armstrong at Barrow, have been delivered.

No further construction is projected beyond a few fast motor-boats with special apparatus for the destruction of mines.

GREECE.

Messrs. Yarrows are building two destroyers of similar design to the British "H" class to the order of the Greek Government.

The keels were laid at Scotstoun on February 8, 1937, and the vessels are due for delivery by the end of 1938. The armament is being supplied from Germany. Two more are projected, and it is proposed to build them in Greek yards.

NETHERLANDS.

The Dutch Government has been turning an anxious eye towards their responsibilities in the East Indies, and 30,000 residents in those colonies have petitioned for a material increase in the naval and air defences maintained there. Quite early in 1937 it was announced that the naval forces in those waters would be increased "in view of the existing international situation." Since then the aggressive policy pursued by Japan in China must have tended to enhance Holland's anxiety. The Minister of Defence has also given it as his opinion that the fleet available in European waters is insufficient, and he advocated that the Navy should be brought up to the following strength in various classes of vessels and aircraft: three cruisers; two flotilla leaders; twelve destroyers; eighteen submarines for service more especially in the East Indies, and in addition a few for home waters; three flotilla vessels—one for service in the West Indies; one gunnery ship; six vessels for the protection of mine-fields in home waters; eight minelayers; at least twelve minesweepers; a number of torpedo motor boats and small auxiliaries; seventy-two large seaplanes; and a number of smaller aircraft for training and embarkation.

The estimates for 1938 include a cruiser to replace the Sumatra. This vessel will be of slightly greater displacement and better armoured than her predecessor; she will carry eight 5·9-in. guns in double turrets and six 1·5-in. A.A. machine guns. Provision is also made for the construction of two destroyers; these with the two in the budget of the Ministry of the Colonies for 1937 and the eight in the Netherlands East Indies, will complete the specified twelve. Three submarines, K25, 26, 27, to be laid in 1938 will replace older craft. Twelve large seaplanes will go partly to replace older aircraft and partly to build up the designed quota. New motor-torpedo boats will replace the old torpedo boats forming the flotilla now in the East Indies. Another interesting item is an outlay of two million florins for the armament of merchant ships for defensive purposes. It is also intended to build up a reserve of guns which could be used either for arming merchant vessels or for coast defence.

Vessels already under construction include the small cruiser, officially classed as a flotilla leader, the Tromp, launched on May 24 last; a gunnery training ship, the Van Kinisbergen, which will replace the Gelderland; four submarines—K.21, K.22, K.23, and K.24; a 1,500-ton minelayer, which is to be used for instructional purposes; and eight 525-ton minesweepers, the latter being for the Dutch East Indies. A second ship of the "Tromp" class is to be laid down in 1938.

The old coastal armoured ship De Zeven Provincien, whose native crew mutinied and tried to make off with her, is being transformed into a training ship. Her name has been changed to Soerabaja.

POLAND.

Like Estonia, Poland raises funds to assist new construction by voluntary subscriptions. During 1937 a sum of 2,460,774 zlotys (about £94,600) was raised to go towards the cost of the submarine Marshal Pilsudski. Subsequently a meeting of village headmen in the Kielce area decided to make a collection to pay for building a coastal motor-boat to be called the Wojt Polski (Polish Village Headman).

The 2,000-ton destroyers Blyskawica and Grom were completed during 1937.

It is credibly reported that long-range coastal batteries are being installed on the Hela peninsula. These works, which are due to be finished in 1938, will form part of the defences of the war harbour of Gdynia.

SWEDEN.

Vice-Admiral C. de Champs, who was appointed Acting Chief of the Navy and Chief of the Naval Staff up to June, 1937, was appointed Chief of the Navy as from the end of that month. He is an ardent advocate for reorganising and strengthening the Fleet.

A new Defence Law for the Navy came into force on July 1. Under this, the entire coast is divided into six naval districts, which are responsible for the defence of their respective sections of the coast and shipping. Two new districts, Gotland and Oresund, have been added to the previous four—Härnösand, Göteberg, Stockholm, and Karlskrona. The war depots, Naval dockyard, reserve ships, and the Intelligence and Liaison Organisation are subject to the District Chiefs in peace-time. All vessels not fully commissioned will belong to ships' depots. Readiness for war will be maintained by constant commissioning for exercises.

The first two of a new class of minesweeper intended to work in the archipelago waters were launched from the Ekensberg shipbuilding yard on August 12. They will be called Minsveparen 1 and 2, and displace 63 tons.

TURKEY.

According to a Press report, Turkey has a projected programme for the construction of one 10,000-ton and one 8,000-ton cruisers, four destroyers, and four submarines.

There are at present four submarines building—two at Hamburg and two under German supervision at Ismit. They will be similar to the Gür, a craft of German design built at Cadiz and purchased in 1934.

YUGOSLAVIA.

The naval construction programme includes one flotilla leader, three to five destroyers, two minelaying submarines of 600 tons, two coastal submarines of 250 tons, and eight motor-torpedo boats of 40 tons.

Two of the destroyers are being built at Split and one at Nantes. The engines and boilers for all three vessels are being supplied by Messrs. Yarrow of Scotstoun. The motor-torpedo boats have all been ordered from Germany; they are craft of about 45 to 50 tons displacement, burning petrol and with a speed of about 38 knots. They carry two 21-in. torpedoes, which can be fired from forward, one each side; also a pom-pom, machine gun, depth-charge thrower, and smoke-making apparatus. It is understood that the two small submarines will also be constructed in Germany.

The British-built leader Dubrovnik is reported to have proved most satisfactory to the naval authorities.

SOUTH AMERICAN COUNTRIES.

ARGENTINA.

The new construction programme, the most important units of which are being built in Britain, is beginning to take effect. The training cruiser La Argentina was launched from the Vickers-Armstrong's shipyard at Barrow-in-Furness on March 16 by the wife of the Argentine Ambassador in London. The ceremony was attended by the officers of the Naval Commission which is supervising the large number of orders which are being executed for the Argentine by British firms.

On June 25 the destroyer San Juan was launched at Clydebank from Messrs. John Brown's shipyard. A sister ship, the San Luis, was put afloat from the same yard just two months later. In September four more of this class took the water—the Corrientes, Entre Rios, and Buenos Aires at Messrs. Vickers-Armstrong's Barrow works and the Misiones from Cammel Laird; followed in November by the Santa Cruz from the same yard. All these vessels are similar to the British "G" and "H" classes, and all were laid down in 1936. Five more are projected.

The first warship to be built in a private yard in the Argentine is the 450-ton minesweeper Parker, launched from the Sanchez Shipyard at San Fernando on May 2 last. A fifth vessel, the Spiro, was launched on June 7. Like the earlier ships of the class, she was built in the Navy Yard at Rio Santiago. Two more of these minesweepers are building in private yards.

A regular system has been adopted by the Ministry of Marine for naming Argentine warships. Armoured cruisers are to be named after men prominent in the history of the country's emancipation; cruisers after naval heroes; torpedo boats after provinces and national territories; submarines after inland celebrities; minelayers after naval officers who distinguished themselves in the wars of independence; gunboats after river ports or naval actions; tugs after Indian tribes; and smaller craft after fish and sea-birds.

In the course of last year, relief appointments were made of a Captain and Commander of the U.S. Navy as naval advisers to the Argentine Naval War College. The United States is also providing the fleet with new Naval Patrol aircraft.

BRAZIL.

An appreciable start has been made in the programme of new construction detailed in last year's " Brassey " and it is satisfactory to note that Brazil is returning to Britain, the birth-place of her two " Dreadnought " battleships, for the latest additions to her fleet. At the end of 1937 she placed orders for six destroyers similar to the British " H " class, two each with Messrs. Thornycroft, Samuel White, and Vickers-Armstrong.

Three destroyers similar to the U.S. " Mahan " class are being assembled at Rio, the material being imported from the United States. Three 620-ton surface displacement submarines, built at Spezia and originally intended for the Italian Navy, were completed for Brazil in September. A river monitor of 600 tons, the Parnahyba, is completing at Rio and will be followed by a similar craft to be called the Paraguassu. Six small minesweepers of 552 tons displacement are building or about to be laid down in national yards.

The construction of two cruisers and five more submarines appears to have been deferred for the present.

CHILE.

It is proposed to raise the necessary funds for a naval rearmament programme by special taxation on copper. About £2,500,000 will be made available and this will be spent on two new 8,000-ton cruisers. Tenders for these vessels have been invited from certain British and Italian firms. A 6,000-ton training ship is also projected.

The destroyer Almirante Uride has been struck off the effective list, leaving only two of a class of four originally commandeered by Britain, where they were completing, in 1914. One was sunk at Jutland, the remainder were turned over to Chile in 1920.

URUGUAY.

Tenders have been obtained for a sailing training ship for the Uruguayan Navy. This will, presumably, supersede the existing small cruiser Uruguay, which is used as a training ship for midshipmen.

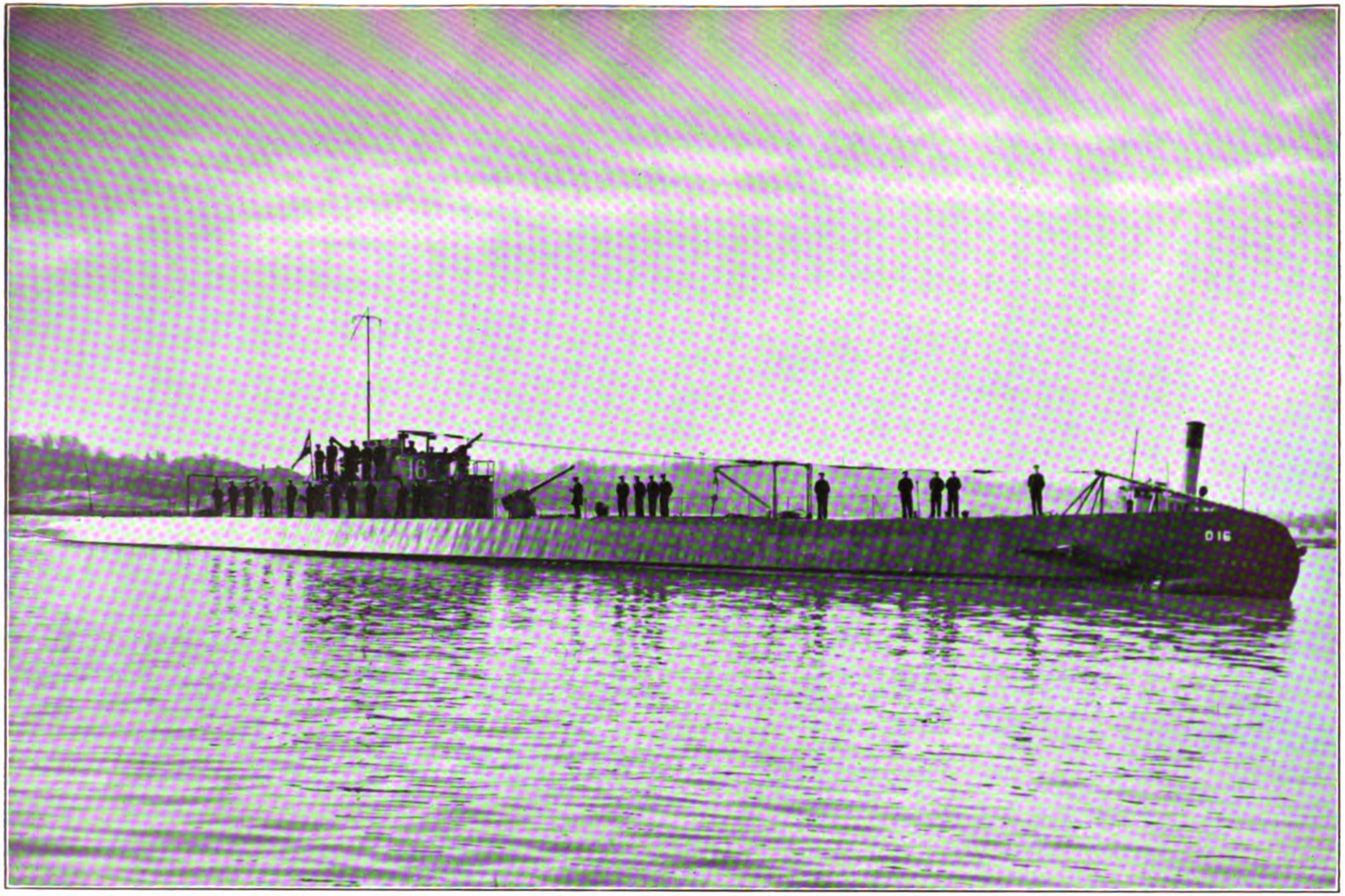
VENEZUELA.

It is reported that Venezuela has been negotiating in Germany for the construction there of two destroyers of modern design.

ASIATIC COUNTRIES.

CHINA.

Although reports of the casualties to the Chinese Navy in the Sino-Japanese war are by no means complete, it is already obvious that a number of ships have already fallen victims to enemy bombers. This is not at all surprising, as they have been nothing but " sitting targets," and it is quite evident that the anti-aircraft defences have been practically negligible.



THE NETHERLANDS SUBMARINE O 16.

Completed 1937.

(By courtesy of the Commanding Officer, Lieutenant J. F. Van Dulm, R.N.M.)

The following losses are based on reliable information. The new 2,500-ton cruiser Ning Hai, built in Japan for China, has been sunk; her sister ship, the Ping Hai, built at Shanghai, is badly damaged and beached. The old cruiser Hai Chou was sunk on October 7 in the Canton River near Whampoa by bombing; the Ying Jui was sunk on October 24 near Nanking by dive bombing; her sister ship, the Chao Ho, was sunk on September 30 in the approaches to the port of Canton, also by bombs. The 1,650-ton cruiser Yat Sen is reported to have been set on fire and sunk or stranded near Nanking. The gunboat Yung Chien is reported to have been sunk. The torpedo-boat Hu Peng is badly damaged, and at least one other has been sunk. Two M.T.Bs. were lost in making an unsuccessful attack on the Japanese coast-defence ship Idumo, and several more river gunboats are believed to have been lost or damaged by bombs.

Without exception these were small unarmoured vessels, and those which were destroyed by aircraft afford striking evidence of the defenceless state of such warships lying at anchor in a narrow water-way without efficient anti-aircraft armaments and with ill-trained crews, quite apart from the fact that Chinese air forces seem to have been conspicuous by their absence.

SIAM.

The extensive new construction programme, details of which were given in this chapter in last year's "Brassey," is well under way. The first of the two 2,200-ton coast-defence ships, building at Kobe, was launched on July 21 last. She has been named the Ahidea. Her sister ship is on the stocks. Two 1,400-ton training ships were delivered by the Vraga Dock Co. in June. The four 370-ton submarines are all in the water; the first pair are nearly completed, and the second were launched in May last.

The nine Italian-built 470-ton torpedo boats have all been delivered; also two small Diesel-engined minelayers.

Three motor-torpedo boats of the C.M.B. type—Nos. 6 to 8—built by Messrs. Thornycroft are other recent additions to the new Siamese navy.

E. A.

CHAPTER III.

RELATIVE NAVAL STRENGTH.

I. QUANTITATIVE.

The first year following the lapsing of the Washington and London Naval Treaties of 1922 and 1930, on December 31, 1936, produced no surprises calculated to disturb seriously the relative positions of the Powers concerned. There were reports at the end of the year that Japan was embarking upon the construction of battleships of 43,000 or 45,000 tons, as compared with the treaty limit of 35,000 tons, but they lacked confirmation. Otherwise construction proceeded on normal lines. So far as the ships passed into service were concerned, the outstanding feature of the year was the increase in the Italian Navy in destroyers and submarines. Her strength in these classes has never been so high, and in submarines now exceeds that of France. This is but one example of the expansion which has taken place in European navies, which shows no sign of abatement. Another is to be found in the contemplated additions to the Soviet Fleets. At present they comprise chiefly small units, but shipyards are being prepared, it was officially stated on January 15, for the building of larger vessels.

Over a period of ten years the total force of the British Navy in the four principal types of ship has declined. That of Italy, on the other hand, has increased by 50 per cent. That of Germany has doubled, although in her case it is due to the reconstruction of the fleet from the coast defence basis to which it was restricted by the Versailles Treaty.

The following table shows the present position in completed ships of the principal European Powers, compared with that in 1928 :

1928.

	Capital Ships.	Cruisers.	Destroyers.	Submarines.	Total.
Great Britain	20	48	176	56	300
France . .	9	12	65	62	148
Italy . . .	6	12	79	46	143
Germany . .	8	9	17	—	34
Three Powers combined .	23	33	161	108	325

1938.

	Capital Ships.	Cruisers.	Destroyers.	Submarines.	Total.
Great Britain	15	59	161	54	289
France . .	6	17	61	78	162
Italy . . .	4	25	112	81	222
Germany . .	5	6	22	36	69
Three Powers combined .	15	48	195	195	453

CAPITAL SHIPS.

No new capital ships were completed for any of the Powers during 1937, but construction proceeded with sixteen vessels, and more are projected. Of the three Powers who were released from their obligation not to build any new battleships when the London Naval Treaty expired on January 1, 1937, Great Britain made the earliest start by the laying-down of 5 vessels between January and July. The United States laid down 2 in the last quarter of the year. Japan no longer supplies information as to her programme, but there was no authoritative news up to the end of 1937 that she had begun the first two ships of her replacement programme. The earlier start of Great Britain is due to her position as a European Power and to the fact that in Continental countries battleship construction had already been in progress for some time—in France since 1932 and in Germany since 1934. So far, the British programme secures only the European position. Taken in conjunction with her existing battle fleet, it is indisputable that, as the First Lord, Mr. Duff Cooper, said in a speech in London on January 12, 1938 : " Britain at present held a tremendous supremacy in Europe so far as the Navy was concerned. All great international wars had been decided by sea power. That supremacy which we possessed we could easily maintain and increase."

The present British supremacy in capital ships completed, compared with European navies, amounts to 15 ships to the French six, the Italian four, and the German five, which is equivalent to a three-Power standard. This supremacy, however, is very much of a wasting asset by reason of the advanced age of most of the ships. Twelve out of the 15 are over twenty years old. Of the other three, the Hood is seventeen years old, and the Nelson and Rodney ten years old. With the passage of years it is the building effort which is being made now which will determine the relative strength of the Fleet ten years hence and onwards. So far, that effort provides only for a one-Power standard in Europe. It should give this country in 1941, 5 new ships, to the 4 each of France, Germany, and Italy. In addition to these 5 ships, so long as the Nelson, Rodney, and Hood remain effective, the margin of superiority should be as two ships to one, until the Hood reaches her age limit in 1945, presuming no further ships are completed abroad.

There remains the situation in the outer seas, and it is for this that provision has still to be made. The extent of it must be problematical until the plans of Japan are made known. Her non-acceptance of the 14-in. gun limit means that the next group of battleships may carry larger weapons than those already in hand.

The construction of armoured ships has proceeded during the past year as follows :

Great Britain.

Ship.	Tons.	Guns.	Laid Down.	Launched.	Complete.
King George V. . .	35,000	14-in.	1.1.1937		1940
Prince of Wales . .	,,	,,	1.1.1937		1940
Anson	,,	,,	5.5.1937		1941
Beatty	,,	,,	1.6.1937		1941
Jellicoe	,,	,,	20.7.1937		1941

United States.

Ship.	Tons.	Guns.	Laid Down.	Launched.	Complete.
North Carolina . .	35,000	16-in.	27.10.1937		1941
Washington . . .	,,	,,	1938		1942
2 ships	,,	,,	1938		1942

Japan.

Ship.	Tons.	Guns.	Laid Down.	Launched.	Complete.
2 ships	35,000	16-in.	(Projected, no information as to progress.)		

France.

Ship.	Tons.	Guns.	Laid Down.	Launched.	Complete.
Dunkerque . . .	26,500	13-in.	1932	1935	1936
Strasbourg . . .	,,	,,	1934	1936	1938
Richelieu	35,000	15-in.	1935	—	1939
Jean Bart	,,	,,	1937	—	1940

Italy.

Ship.	Tons.	Guns.	Laid Down.	Launched.	Complete.
Vittorio Veneto . .	35,000	15-in.	1934	1937	1939
Littorio	,,	,,	1934	1937	1939
Roma	,,	(?)	1938	—	1941
Impero	,,	,,	1938	—	1941

Germany.

Ship.	Tons.	Guns.	Laid Down.	Launched.	Complete.
Scharnhorst . . .	26,000	11-in.	1934	1936	1938
Gneisenau	,,	,,	1934	1936	1938
"F"	35,000	15-in.	1936	—	1940
"G"	,,	,,	1937	—	1941

It will be noted that Italy will have the most powerful of these foreign battle squadrons, all her ships being of the largest size. In a statement in Paris on January 31, 1938, M. Bertrand, the Minister of Marine, said that the evolution of world naval policy had taken on an entirely new phase during the previous month, and French plans of 1937 would have to be revised in order to re-establish her naval position, which was threatened. He hinted at the immediate laying-down of two more 35,000-ton ships.

CRUISERS.

As was noted in "Brassey's" last year, there is less activity in the construction of cruisers in foreign countries than formerly, possibly because effort is being centred more in the building of battleships. The number of cruisers building or ordered for the five principal foreign Powers on January 1, 1938, was 19, which compared with 23 a year earlier and 25 two years earlier. This total of 18 was made up of 8 in the United States, 2 in Japan, 2 in France, none in Italy, and 7 in Germany. In Great Britain, 12 new cruisers were begun, 5 belonging to the 1936 programme and 7 to that for 1937; which figure, added to the 5 begun in 1936, gives a total of 17 in hand on January 1, 1938, nearly as many as all the other Powers put together. This affords an indication of the energy with which the British re-armament programme is being executed. It was significant that the French naval programme for 1938, published on October 8, 1937, included only one cruiser; and that the Italian programme, published on January 7, 1938, included no new cruisers, although provision was made therein for 12 scouts (*esplatori*), which will presumably be improvements of the " Tarigo " class (1,628 tons, 4·7-in. guns) built in the years 1927–31.

The following table summarises the cruiser activity of the six principal Powers during 1937:

CRUISERS COMPLETED DURING 1937.

Great Britain.	United States.	Japan.	France.	Italy.	Germany.
Southampton	Vincennes	Suzuya	Marseillaise	G. Garibaldi	Admiral Hipper
Newcastle	Brooklyn	Kumano	Gloire	D. d. Abruzzi	Blücher
Glasgow	Philadelphia		Montcalm		
Sheffield			Georges Leygues		
Birmingham					
Aurora					
6	3	2	4	2	2

CRUISERS LAUNCHED DURING 1937.

Liverpool	Wichita	Tone	Nil	Nil	Admiral Hipper
Manchester	Savannah				Blücher
Gloucester	Nashville				
	Honolulu				
3	4	1	—	—	2

OTHER CRUISERS CONTINUED DURING 1937.

Belfast	Boise	Tikuma	Nil	Nil	" J "
Edinburgh	Phœnix				
	Helena				
	St. Louis				
2	4	1	—	—	1

CRUISERS LAID DOWN OR ORDERED DURING 1937.

Dido	Nil	Nil	De Grasse	Nil	" K "
Euryalus			1 ship		" L "
Naiad					" M "
Phœbe					" N "
Sirius					
Hermione					
Bonaventure					
Fiji					
Kenya					
Mauritius					
Nigeria					
Trinidad					
12	—	—	2	—	4

TOTALS FOR THE YEAR.

23	11	4	6	2	9

These figures afford further indication of the extent of British re-armament, which is more marked in the cruiser class—that particularly concerned in commerce protection—than in any other. During 1937 the British shipyards were engaged on a total of cruisers which equalled their entire output during the ten years from 1921 to 1930. This volume of work is necessary in order to overtake arrears of building which accumulated during the years when the Royal Navy lived on its War output, now passing into decay.

The numbers of new cruisers completed for the principal Powers since the War are shown in the accompanying statement :

Year.	Great Britain.	U.S.A.	Japan.	France.	Italy.	Germany.
1920	—	—	1	—	—	—
1921	1	—	4	—	—	—
1922	4	—	3	—	—	—
1923	—	6	3	—	—	—
1924	1	3	1	—	—	—
1925	1	1	3	—	—	1
1926	2	—	2	1	—	—
1927	—	—	2	2	—	—
1928	7	—	1	2	—	—
1929	4	1	3	—	2	2
1930	3	4	—	2	—	1
1931	1	3	—	1	4	1
1932	—	2	4	2	6	—
1933	2	1	—	—	1	—
1934	2	4	—	1	—	—
1935	4	—	2	1	3	1
1936	3	1	—	1	1	—
1937	6	3	2	4	2	—
Totals .	41	29	31	17	19	6

In cruisers, as in battleships, Great Britain possesses an overwhelming superiority in Europe, her total of 59 being more than equal to a three-Power standard (17 for France, 25 for Italy, and 6 for Germany). But in cruisers, as in battleships, it is a numerical superiority based upon a preponderance of older vessels which must show a progressive decline in the years immediately ahead, checked only by the extent of new construction. In cruisers under ten years of age from date of completion, the relative figures are: Great Britain, 32 ; France, 14 ; Italy, 19 ; Germany 5. This alters the position of more than a three-Power standard to one less than a two-Power standard.

So, too, in the outer oceans. The British total of 59 cruisers exceeds by 7 the combined totals of the United States and Japan (29 and 33 respectively or 52 together). But comparing cruisers under ten years of age, the British total of 32 is only one more than the combined total of the United States and Japan (19 and 12 respectively, or 31 together).

BRITISH CRUISER STRENGTH.

On January 1, 1938, the total number of cruisers on the effective list of the Royal Navy was 59. This showed an increase of 6 over the total on January 1, 1937, due to the fact that 6 new cruisers (5 of the "Southampton" type and the Aurora) were passed into service during 1937, and no old cruisers were scrapped. Of these 59 cruisers there are 40 within the age limit of sixteen years from date of completion adopted at the London Naval Conference in 1930, leaving 19 cruisers over that age limit. The latter are the remaining vessels of War programmes, chiefly small cruisers of the "C" and "D" types laid down in 1916–18. Two of them, the Coventry and Curlew, have been converted into anti-aircraft ships. British cruiser strength is at present made up as follows:

"C" class, completed 1916–22, 3,895–4,290 tons, five 6-in. guns	**13**
Adelaide (Australian Navy), 1922, 5,100 tons, nine 6-in. guns	**1**
"D" class, completed 1918–22, 4,850 tons, six 6-in. guns	**8**
"E" class, completed 1926, 7,550–7,580 tons, seven 6-in. guns	**2**
"Hawkins" class, completed 1918–25, 9,770–9,860 tons, nine 6-in. guns	**3**
"County" class, completed 1928–30, 9,730–10,000 tons, eight 8-in. guns	**13**
"York" class, completed 1930–31, 8,250–8,390 tons, six 8-in. guns	**2**
"Leander" class, 6,840–7,140 tons, eight 6-in. guns	**8**
"Arethusa" class, 5,220 tons, six 6-in. guns	**4**
"Southampton" class, 9,100 tons, twelve 6-in. guns	**5**
Total	**59**

THE CRUISER PROGRAMME.

It is the policy of the Government in regard to cruisers to increase the total number to 70, of which 60 would be under-age and 10 over-age (White Paper of March 3, 1936). These figures cannot be achieved until 1942, at the earliest. To overtake the arrears of shipbuilding which accumulated during the treaty years is naturally a slow process. During 1938 only 3 new cruisers are due to be passed into service, the Liverpool, Manchester and Gloucester, increasing the total to 62 if no obsolete cruisers are scrapped. But during the year the 19 cruisers already over the age limit will be increased by 4, as the Despatch, Diomede, Capetown, and Adelaide, all completed in 1922, reach their limit of sixteen years. On balance, therefore, the cruisers within the age limit will be reduced by one, and at the close of the year the position will be: cruisers under age, 39; over age, 23; total, 62.

During 1939, however, the position will improve materially. Seven cruisers of the Dido class, and the Belfast and Edinburgh, laid down during 1937, will then become effective, and no ships attain their age limit during the year, so that by the end of 1939 (assuming no ships are actually scrapped), the position should be: cruisers under age, 48; over age, 23; total, 71.

It will probably be found, however, that several of the 23 over-age cruisers will by then have been scrapped as totally unfit for effective service, especially as by that time all but one of the "C" class cruisers will be over twenty years of age. Thus it will not be until 1940, when the 5 cruisers of the "Fiji" class (laid down during 1938) come into service, that a strength of 70 cruisers will be reached, and then only by the retention of about 17 cruisers which have passed their age limit. During 1940 the Frobisher will pass on to the over-age list; during 1941 the Effingham; and during 1942 the Emerald and Enterprise. To bring the total of over-age cruisers down to 10, therefore, while keeping up the strength in all classes to 70 ships, will require 11 new cruisers to be provided in the Navy Estimates of 1938 and 1939, and at the normal rate of building it will not be until 1942 that such ships will be ready for service.

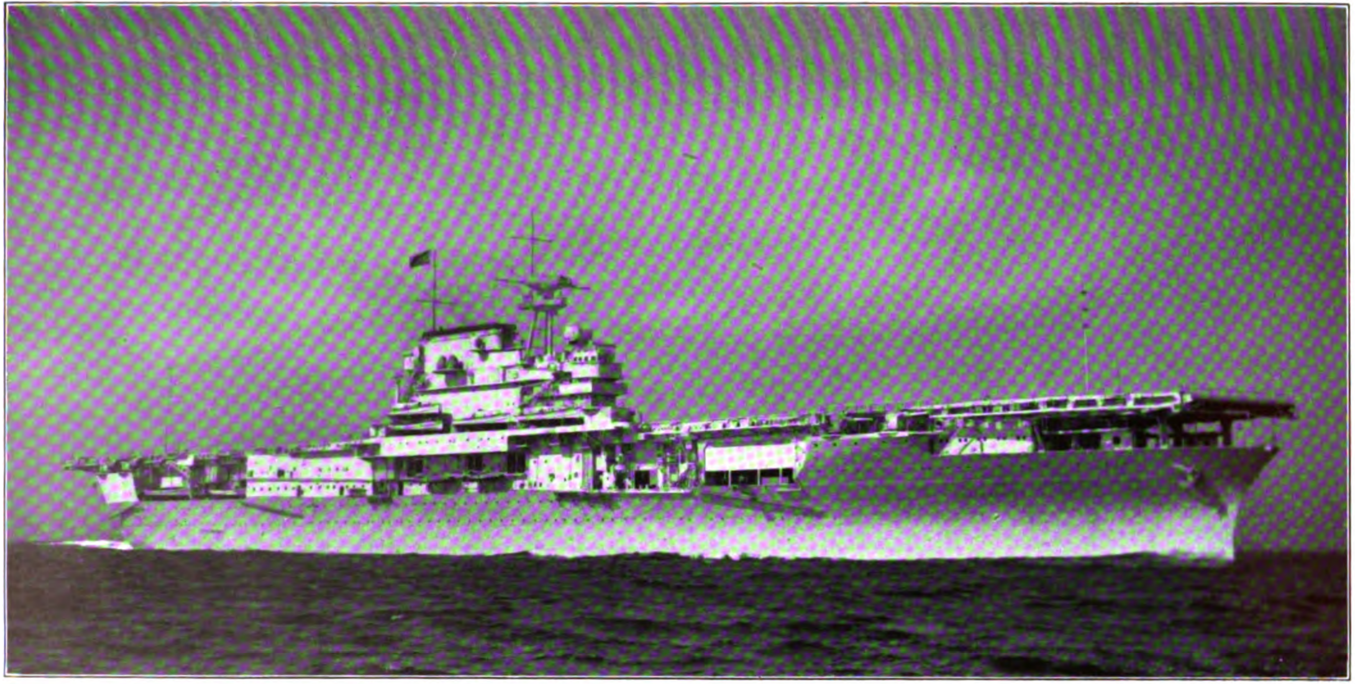
AIRCRAFT CARRIERS.

There were some notable developments during 1937 in the provision of aircraft-carriers. Great Britain laid down 4, the Illustrious, Victorious, Formidable, and Indomitable, and launched one already in hand, the Ark Royal. These 5 vessels represent the rebuilding of the entire aircraft-carrier branch of the Fleet, all the vessels of which were laid down between twenty and twenty-five years ago. The United States continued the construction of her three ships Yorktown, Enterprise, and Wasp, which are due to be completed in 1938. The first-named was commissioned on September 30, 1937. They will increase her total of carriers to 6, with an aggregate displacement of 135,000 tons—precisely the amount adopted as the total tonnage for aircraft-carriers by Great Britain and the United States in the Washington Treaty of 1922. The corresponding figure for the new British carriers cannot yet be determined, as authoritative information concerning them is not available.

Japan continued the construction of the Soryu and Hiryu (launched in 1935 and 1937 respectively), and is to lay down a third new ship in 1938, the Koryu. Without the latter, her tonnage in carriers built and building amounts to 88,470 tons, which is 7,470 tons more than the quota allotted to her in this class under the Washington Treaty. In the number of her carriers built and building, 6, she equals the United States, but her ships are of smaller size and capacity. They are believed to be able to accommodate 240 aircraft, whereas those of the United States could probably operate 360 aircraft.

Germany has in hand two aircraft-carriers, begun in 1936, each of which is stated unofficially to be designed for 50 aircraft. A sequel to this is the inclusion of 2 carriers in the French naval programme for 1938, the first to be built as such for the French Fleet. When the Estimates were before the Chamber of Deputies on December 10, 1937, the Rapporteur of the Naval Committee of the House pointed out that the only aircraft-carrier, the Bearn, laid down in 1914 as a battleship, was out of date and had not a single fighter on board. The provision of new ships in this class was much overdue.

The only large Power which has no aircraft carriers built or building is Italy, nor were any included in her construction programme for 1938 published on January 7. Her geographical position renders them less necessary. In this connection, Signor Fioravanzo, in a recent work, considers Italy to be the strongest factor in the Central



THE UNITED STATES AIRCRAFT CARRIER YORKTOWN.

Completed 1937.

(*Official U.S. Navy Photograph, by courtesy of Navy Department.*)

Mediterranean and more powerful than either Britain or France in the eastern sector, while thanks to her Sardinian bases she could exert strong pressure in the western area. An Italo-Grecian alliance, affording the use of numerous islands and anchorages in the Ægean, would also be advantageous. " If Italy possessed air supremacy," in his view, " she would be mistress of the entire Mediterranean."

FLEET AIRCRAFT.

In reply to a question in Parliament on June 10, 1937, the First Lord, Mr. Duff Cooper, gave the following figures as to the number of aircraft then at the disposal of the British, American, Italian, Japanese, and German navies, and the approximate changes in such numbers during the previous five years :

	1932.	1937.
British Navy	139	204
American Navy	464	709
Japanese Navy	250	461
Italian Navy	30	60
(Plus on each date a certain number of shore-based reconnaissance aircraft.)		
German Navy	nil	16

The First Lord added that the British figures are not comparable with those given in respect of the other countries, as aircraft not allotted to H.M. ships are under the control of the Royal Air Force.

DESTROYERS.

The principal change in the totals of flotilla leaders and destroyers in comparison with last year is the increase in the Italian figures. Her strength of 112 vessels, with 30 more building, places her third among the naval Powers, after the United States and Great Britain. Her progress during the past four years has been :

1934.		1935.		1936.		1937.	
Built.	Building.	Built.	Building.	Built.	Building.	Built.	Building.
91	6	96	8	101	14	112	30

Before the signing of the London Naval Treaty of 1930, Great Britain had a substantial preponderance in destroyers over the combined strengths of France and Italy—156 vessels as compared with 137 (France, 61 ; Italy, 76). This margin more than disappeared during the period of the treaty. At present Great Britain has 161 vessels to the Italian 112 and the French 61. Despite the increase in the British programme, her relative position will decline still further when ships in hand are completed, viz. 193 vessels to the Italian 142 and the French 69. Italian destroyer strength has increased threefold since the War. The figures of the three Powers in 1919 were : Great Britain, 282 ; France, 76 ; Italy, 48.

Compared with Italian activity, the German destroyer programme is modest. By the proportion of 35 : 100 in relation to the British

Navy contemplated in the agreement of June 18, 1935, she can build up to about 67 vessels, and at present she has 22 built and 16 building.

The British destroyer total increased from 153 to 161 during 1937 by the completion of 8 vessels of the " Intrepid " class, and no vessels were scrapped. Of the total, 88 are within the age limit of sixteen years agreed upon at the London Naval Conference of 1936, and 73 are over that age limit. The United States has an even larger proportion of obsolete vessels in her flotillas, as on January 1, 1938, only 29 of her destroyers were within the age limit of sixteen years. Japan, on the other hand, has the lowest proportion of obsolete destroyers of any of the large Powers. Official figures of her forces on December 3, 1937, showed that the position was as follows :

Under-Age.		Over-Age.		Total.	
No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
80	108,363	24	22,885	104	131,248

British destroyer construction has hitherto merely served to replace wastage and not to restore the standard of strength to what it formerly was. In particular, it has not kept pace with the amount of submarine construction in Europe. In 1932 there were more British destroyers than there were submarines in the three principal Continental navies, the figures being 151 destroyers as compared with 126 submarines (70 French, 37 Italian, 19 Russian). Germany then had no submarines. To-day the destroyers number 161 ; the submarines in the navies mentioned have increased to 183 (78 French, 81 Italian, 24 Russian), and in addition Germany has completed 36 submarines. The comparison will be still more unfavourable to Great Britain when the large submarine programmes in Italy and Russia are completed. By contrast, it may be recalled that in August, 1914, there were in the British Navy 215 destroyers and 106 torpedo boats, which total of 321 was more than twice as many as the number of submarines in all the European navies put together.

SUBMARINES.

A significant change in the relative positions in regard to submarines occurred during 1937, when France, for so many years the leading Power in this type of vessel, was displaced by Italy. The French total of completed submarines declined from 82 to 78 ; that of Italy increased from 65 to 81. Moreover, while France has only 12 submarines building, Italy has 25 and is credited with the intention of laying down still more. A Press report from Rome on January 24, 1938, mentioned that Italy intends to have a submarine fleet of 170 vessels before 1941, when her 1938 programme should be completed. Some of her new vessels, added this report, will be ocean-going craft capable of sailing round Africa without refuelling—a voyage of approximately 5,500 miles.

Changes in the strength of the Powers in submarines during the past seven years have been as follows:

	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Great Britain	58	54	56	54	51	51	54
United States	94	81	82	84	84	79	85
Japan	66	62	62	66	57	66	58
France	70	82	84	100	82	82	78
Italy	37	42	46	46	64	65	81
Germany	—	—	—	—	14	31	36
Russia	19	22	22	22	23	23	24

So much for submarines completed and effective. When building programmes in this type are reviewed, the most remarkable feature is the large amount of construction in progress in Soviet Russia. She has no less than 77 vessels in hand. The highest recorded total of her completed submarines in any year since the War was 31. The Soviet Navy should have, when those now building are completed, about 100 submarines, which would make her numerically the strongest Power in these craft. In fact, a report published in Berlin in November, 1937, and stated to be on the authority of the German Admiralty, declared that Russia already possessed the largest submarine fleet in the world. According to this report, there were in the Baltic and White Sea 16 large, 30 medium, and 25 small submarines; in the Black Sea, 30; and in the Far East, 50, making a total of 151. These figures lack official confirmation, and are probably exaggerated, but they are indicative of the great effort which is being made to increase the strength of the under-water flotillas. It is known from a speech of Admiral Orloff, Commander-in-Chief of the Soviet Navy, at the Congress of Soviets on November 29, 1936, that recent efforts of the U.S.S.R. to strengthen its Red Fleet "had chiefly concentrated on submarines. These had increased sevenfold since 1933." * In that year Russia was credited with about 22 submarines.

Nominally the United States has the largest submarine flotilla, but of her 85 vessels 64 are now over the age limit of thirteen years adopted for this class. Italy, on the other hand, has only 8 submarines over the age limit.

Official figures concerning Japanese submarines on December 3, 1937, were as follows:

Under-Age.		Over-Age.		Total.	
No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
42	60,500	15	13,248	57	73,748

Corresponding figures for the United States and Great Britain, corrected up to July 1, 1937, were:

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* *The Times*, November 30, 1936.

	Under-Age.		Over-Age.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
United States	29	38,950	54	35,640	83	74,590
Great Britain	39	47,319	15	8,590	54	55,909

The total submarine tonnage which was accepted in 1930 by the three Powers to be reached by December 31, 1936, under the London Naval Treaty, was 52,700 tons. Only Great Britain reached this figure, her strength on the date mentioned being 51 vessels of 52,199 tons. During 1937, 3 new submarines, the Grampus, Rorqual, and Sunfish, were completed, and none was scrapped.

PERSONNEL.

Progress was made during 1937 in repairing the wastage in numbers of personnel in the Royal Navy which had occurred in consequence of the reductions in Fleet strength under the treaties. It will be recalled that the numbers voted by Parliament declined in four years by about 10,000 officers and men—from 101,800 to 91,840—between 1928 and 1932. The following figures show the effective strength in personnel in the five principal navies on the dates mentioned :

	Aug. 1, 1914.	Nov. 11, 1918.	Jan. 1, 1931.	Jan. 1, 1938.
Great Britain	152,000	527,000	101,750	112,000
United States	67,258	503,792	109,350	117,000
Japan	50,645	64,122	79,567	107,000
France	69,585	80,000	60,949	69,500
Italy	40,023	127,401	46,430	60,000

The most significant comparison in this table is the strength of the Japanese personnel, which has doubled since 1914 and is appreciably larger than at the date of the Armistice. Owing to differences in administration, the figures are not strictly comparable as between one Power and another—air service personnel, for example, are not all included in every case.

G. H. H.

II. A QUALITATIVE EXAMINATION.

Anyone who sets out to compare the quality of the vessels composing the British Navy with those of other countries must take a fairly large number of factors into account. There are, first, the three variables which together constitute the combatant worth of any ship: armament, protection, and speed. These three factors must share between them the greater part of the available capacity of any given size of ship to support a certain weight of material. They are not, indeed, the only factors that call for consideration. There are various what might be called "fixed charges," in the shape of habitability and provision and store accommodation, which have to be met before the final net profit can be divided among the different classes of shareholders. Nevertheless, it is these three claimants, armament, protection, and speed, which absorb the lion's share of the dividend.

Of the three, armament stands out as the most obvious and the easiest measure of fighting value. A ship mounting ten 13·5-in. guns seems on the face of it a more powerful fighting ship than one mounting guns of only, say, 12 or 11-in. calibre. Any such assumption, however, would be a superficial one, as the battle of Jutland brought out with especial clarity. In the battle-cruiser action, a smaller number of German ships armed with smaller guns than our own caused two of the latter to blow up. The reason undoubtedly was that the protection of the British vessels was inadequate. Protection, in fact, should be nicely related to armament. If it is insufficient, ships will not be able to stand punishment long enough to enable their guns to complete the subjugation of the enemy; while if protection is excessive, the armament will probably not be powerful enough to do its work.

The comparative value of protection is more difficult to assess than that of armament. The thickness of side armour and of armoured decks will give a fair indication of a ship's protective equipment, but a great deal will depend as well on the actual placing of the different thicknesses of armoured plating relative to each other and to the vital parts requiring protection, and also on the general system of watertight subdivision. This applies particularly to the constructional arrangement designed to meet underwater explosion. Many of these structural details are not known to foreigners, and consequently an exact comparison of the protective elements of ships of different nationalities is hardly possible.

Even the comparison of armaments is not quite as straightforward as might at first appear. It can be said confidently enough that an armament of eight 15-in. guns is superior to one of eight 14-in. But what if there are ten 14-in. instead of eight? A bare comparison of the weight of the broadsides will hardly suffice. What is really needed is to balance up the greater chance of hitting that would belong to a five-gun over a four-gun salvo against the smaller weight of projectile from the smaller gun. This greater chance of hits per salvo may be a very important consideration. In a six-shot straddle, for instance, the number of hits will probably vary between two and three; whereas in a three-shot straddle, not more than one hit can be looked for.

Speed is a simpler factor to compare than either of the two previous ones, but a much more difficult one to evaluate in terms of fighting power, as the known conflicting opinions on the subject testify. It can be plausibly argued that superior speed gives a ship a clear tactical advantage by enabling it to overtake a retreating enemy and by allowing it to acquire a favourable tactical position if the enemy wishes to fight. On the other side, it can be held that, as an increase of speed can only be made at the expense of either armament and protection or both, for ships of equal size superior speed has perforce to be achieved at the cost of inferior fighting power; a result which might seem to defeat most of the advantage of superior speed. This, of course, would apply chiefly to ships of approximately similar date, as otherwise improvements in engineering over a period of ten or more years might falsify the proposition.

Closely allied to speed is endurance. But as this factor is of strategical importance only, it hardly affects the assessment of a ship's value as a tactical unit.

The three factors of armament, protection, and speed form, therefore, the main elements in any qualitative comparison of navies. They are not, indeed, the only elements. There are certain minor ones as well, such, for example, as size. In a combat, for instance, between 5,000-ton and 10,000-ton cruisers, the smaller ship would enjoy a certain advantage in presenting a smaller target to attack. The same consideration would apply to two ships of equal tonnage whose silhouettes differed markedly in area; such as the British " County " and the Japanese " Nachi " classes.

It would also be necessary to take account of a ship's function in estimating her fighting value. Capital ships, whose chief duty lies in giving battle to similar ships of an enemy, can properly be judged on the basis of their comparative value to corresponding ships of other nations. At the other end of the scale, submarines will only very occasionally be given an opportunity of fighting other submarines. Their main function is to attack surface ships, and their characteristics must therefore be judged chiefly by the light of their fitness for that primary task. In between these two extremes, it will be necessary to remember that cruisers, destroyers, and other intermediate classes of vessel have in most cases a mixed function of fighting similar enemy ships, protecting trade, obtaining information, and of attacking enemy ships of dissimilar classes; whether larger, as in destroyer attacks on battleships, or smaller, as in the case of depth-charge attacks on submarines.

After this preliminary survey, we are now in a position to embark on a more detailed examination of the qualitative value of the various classes of ships of the Navy.

CAPITAL SHIPS

(Battleships and Battle-cruisers).

In comparing British capital ships first of all with American, we should naturally start with the 16-in. gun vessels, of which we have two and the Americans three. In main armament the Nelson and Rodney are slightly superior to the " West Virginia " class, by virtue of mounting nine heavy guns against eight. The American ships carry slightly heavier armour and their protection is probably slightly superior, a superiority which can be held to counteract their small inferiority in main armament. In total fighting power, the " Nelson " and " West Virginia " classes can therefore be placed on an equality.

This leaves ten British 15-in. gun battleships and three 15-in. gun battle-cruisers to be matched against one American 16-in. gun battleship, eleven 14-in. gun battleships, and one battleship mounting 12-in. guns.

The " West Virginias " have an advantage over the " Revenges " or " Queen Elizabeths " both in respect of main armament (eight 16-in. guns to eight 15-in.) and of better protection, side armour being about 3in. thicker and turret shields and armoured decks also stouter. The estimated superiority of the American ship is in the ratio of 11 : 10.

The remaining nine " Revenges " and " Queen Elizabeths " have to be compared with the seven ships of " Tennessee," " New Mexico," and " Pennsylvania " classes, mounting twelve 14-in. guns, and the two ships of the " Nevada " class mounting ten 14-in. In comparing a salvo of four 15-in. shells against one of six 14-in., there is no doubt that the greater number of projectiles in the American salvos more than makes up for their smaller calibre. In protection, the American ships appear to be better equipped. Taken as a whole, the fighting power of the twelve 14-in. gun ships is considered to be again in the ratio of 11 : 10. As regards the " Nevada " class carrying ten 14-in. guns, the extra two guns in this case probably just about counterbalance the larger size of the British 15-in. ordnance. The protection of the " Nevadas " is perhaps very slightly heavier than that of the " Revenges " or " Queen Elizabeth " class, but altogether the total fighting power seems about on an equality.

The British battle-cruisers the Hood and the two " Renowns " have to be matched against the two American battleships of the " Texas " class and the Arkansas. Taking the " Renowns " and the " Texas's " together, we get a salvo of three 15-in. against one of five 14-in. The latter is undoubtedly the more powerful, probably by as much as 20 per cent. In protection the American ships are also superior, the side armour, for instance, being 12 in. to the British 9 in. In armament and protection combined it is estimated that the two American battleships are superior to the " Renown " and " Repulse " by as much as 40 per cent. each.

Finally, the Hood has to be compared to the Arkansas. Here for the first time we can say that the British ship has the advantage both in armament and protection, giving her a superiority which is estimated as being in the ratio of 14 : 10.

Totalling up all the previous estimates of fighting power we get the following table. (See next page.)

We therefore reach the not altogether very comforting conclusion that the relative fighting strengths of the numerically equal British and American capital ship fleets are in the ratio of 154 : 177.

It is admitted that this estimate has been reached by a series of arbitrary assumptions, based on considerations of main armament and armour protection. Such ancillary factors as secondary armament, anti-aircraft armament, watertight subdivision, constructional protection against underwater damage, and other similar points of battle equipment have been taken as being on an equality in both fleets—which may or may not be true, but would take too long to

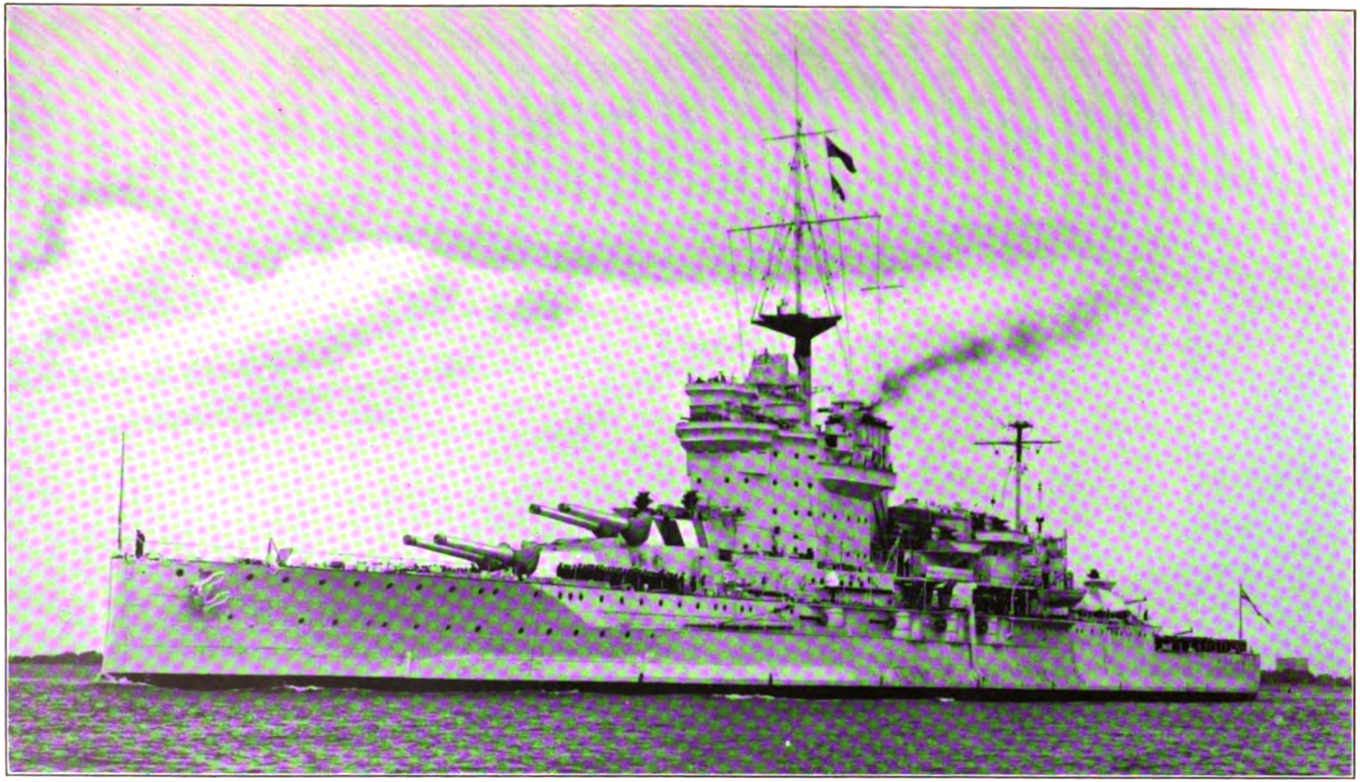
Number of Ships.	British.		American.	
	Class.	Index Figure.	Class.	Index Figure.
2	" Nelson "	20	" W. Virginia "	20
5	" Q.E."	50		
1			" W. Virginia "	11
2			" Tennessee "	22
2			" New Mexico "	33
3	" Revenge "	30		
1			" New Mexico "	11
2			" Pennsylvania "	22
2	" Revenge "	20	" Nevada "	20
2	" Renown "	20	" Texas "	28
1	" Hood "	14	" Arkansas "	10
		154		177

examine in detail, if indeed such an examination could be made to yield reliable results. A broad survey of these ancillary factors suggests, however, that an assumption of equality in regard to them will not be far out.

For the arbitrary assumptions regarding main armament and armour, there might possibly be substituted a more scientific analysis, conducted in terms of weight of broadside, 50 per cent. zones, bursting charges, remaining velocities, armour penetration, and so on. Such an analysis would, however, be extremely lengthy and complicated, and would be subject to so many permutations that on the whole the method of arbitrary estimate appears more satisfactory.

The estimate is not without a certain corroboration on general evidence. It has already been mentioned that the weight-carrying capacity of a ship of any given size must be distributed between the three main elements of armament, protection, and speed. Obviously the bigger the ship, the greater the total available for distribution. Taking battleships only, as grouped for comparison in the preceding discussion, we find that the total American tonnage is greater than the British by a little over 4 per cent. The American ships should therefore be the more powerful. But this excess of tonnage does not account by itself for the greater estimated fighting power assigned to the American ships. The use to which the total tonnage has been put provides however an explanation for the difference. The average speed of the twelve British battleships is 23 knots ; that of the corresponding twelve American ships 20 knots. It follows that a greater proportion of tonnage in the British ships has been put into speed, in which case fighting power must needs be correspondingly less. In comparing the three British battle-cruisers with the three remaining American battleships, an even greater proportion of tonnage has been utilised on speed at the expense of fighting quality.

It would be both too lengthy and too tedious to extend this same detailed analysis to comparison of British capital ships with those of other naval powers besides the United States. It will be sufficient to state the conclusions without following the process



H.M. BATTLESHIP WARSPITE AFTER RECONSTRUCTION.

(Photograph by Cribb, Southsea.)

of reasoning in detail. These conclusions for Japan as well as America are given in the following table, the American results already reached being also included. It has been assumed that, in all cases where programmes of reconstruction are known to be in progress or contemplation, the process has been completed. The estimates of fighting power are given in both cases in terms of the British capital ship fleet, the latter being given the index figure of 100.

Fleet.	Number of ships.	Speed (designed).			Estimated Index of Fighting Power.
		Average.	Fastest Ship.	Slowest Ship.	
British	15	25½	31½	23	100
American . . .	15	20½	21½	19½	115
Japanese . . .	9	24	26	22½	62

What emerges most clearly from a study of the above table is the sacrifice in fighting power made by us in order to obtain speed. This raises the question of whether superior speed is worth obtaining at such a price. For capital ships which are built to fight, it is difficult to think that it is. Superior speed for pursuit is of little use if fighting power is inferior to that of the enemy being overtaken. For tactical purposes superior speed may be held to be an advantage, but the slower though stouter enemy will often be able to nullify it by manœuvring on the inner circle; while superior speed for retreat is a poor reason for foregoing battle power.

It has been stated that our new battleships now building are to mount 14-in. guns, in spite of the United States and Japan having announced their intention of having 16-in. in their new ships. If the British decision to mount the smaller gun is due to an intention to have a greater number of them or to have superior protection, the decision may be perfectly sound. If, on the other hand, the lighter gun is being adopted in order to achieve a higher speed, the policy would be open to the criticism that the essential was being sacrificed to the unessential.

These remarks presuppose that the decision to mount the 14-in. gun is based on the assumption that both American and Japanese new battleships would be kept within the 35,000-ton limit. If, as is rumoured, the Japanese are building or planning 46,000-ton ships, an entirely new situation will have arisen, calling for a complete review of our battleship programme.

CRUISERS.

Unlike all existing capital ships, except the Nelson, Rodney, and Dunkerque, nearly all cruisers are post-Washington and therefore subject to treaty limits. This should have resulted, at all events in regard to the 10,000-ton ships, in a dull uniformity of type.

In practice that has not been the case. Our own 10,000-ton ships differ in a number of points from corresponding foreign ships, and it cannot be said that a comparison is very favourable to our own. The latter's armament of eight 8-in. guns is smaller than the American nine 8-in. and the Japanese ten 8-in. Protection in the British ships is also noticeably inferior, an armoured deck having to compare with side armour as well as deck protection in American, Japanese, Italian, and later French ships. Indeed, the Admiralty have inferentially admitted the inadequacy of protection in the " County " class by having recently fitted the Cumberland and Suffolk with side armour plating. Inferior protection is all the more disadvantageous in ships that present a larger target than any others of similar class.

It might be reasonably expected that, in view of the British ships' inferiority in armament and protection, they would at all events show a superiority of speed over American and Japanese ships. Not even that, however, is the case ; the Japanese actually having a slightly higher speed. It may well be wondered how it is that the British ships show such indifferent qualities on an equal tonnage. It is possible that foreign ships have had too much crammed into them. It is certainly rumoured that the Japanese vessels are inclined to be topheavy ; but no such accusation has been levelled at American, Italian, or other 8-in. gun ships. We must accept the fact that our own " County " class is not one of our most successful constructional efforts.

It was an unfortunate thing that the cycle of cruiser tonnage had just about reached the 10,000-ton mark at the time of the Washington Conference. What this country needs in cruisers is large numbers, and therefore the lower the upper limit of tonnage (within certain bounds) the better for us. Moreover, the War seemed to show that a large cruiser was a misfit. Both in the North Sea and in distant waters the bigger cruisers achieved little beyond getting sunk, the best work being done by the smaller ships ; the " Southamptons " at Jutland, the Emden, the Karlsruhe, and the Sydney abroad. Realising about 1930 the drawbacks of the 10,000-ton, 8-in. gun type, we made a return to the 7,000-ton " Leanders " and 5,000-ton " Arethusas," all with 6-in. guns. Other Powers by agreement also adopted the 6-in. gun, and there was a tendency to follow the British lead towards smaller ships. This tendency was nipped in the bud by the Japanese, with their 8,500-ton " Mogamis " mounting the heavy broadside of fifteen guns. In reply came the British 9,000-ton " Southamptons " and the American 10,000-ton " Savannahs," the former with twelve and the latter with fifteen guns. The British ships, which in tonnage stand between the American and Japanese vessels, mount therefore three less than either. This may appear a sign of weakness in the British design. It is possible to think, however, that the number of guns on a broadside, if increased beyond a certain point, can be a disadvantage, as tending to cause confusion in spotting the fall of shot. If so, it may well be that a twelve-gun salvo represents the economical limit.

The question does arise, however, whether the Japanese and American advance towards 10,000 tons must be met in like manner. The arguments for following suit are of course logically unanswerable. Yet, if we can take the ill fortune that seemed to dog the footsteps of the larger cruisers in the late war (Defence, Warrior, Black Prince, Hogue, Monmouth, Scharnhorst, Gneisenau, Yorck, etc.), together with the astonishing vitality and reluctance to sink shown by light cruisers such as the Wiesbaden, Nottingham, and Falmouth, as indicating the judgment of Neptune on the right size for cruisers, it seems that we should hesitate to allow ourselves to settle down with other Powers at the common 10,000-ton mark. It is at least arguable that the right reply to a Mogami of 8,500 tons is two Arethusas of 5,000 tons rather than one Southampton of 9,000.

DESTROYERS.

The chief point of interest in comparing our own destroyers with foreign ones lies in the rival merits of the 4·7-in. and 5-in. gun. In other respects there is general similarity. All the principal powers are putting 5-in. guns into their new destroyers except the Italians and ourselves, who are adhering to the 4·7-in. weapon, with four of which our own new ships have for a number of years been equipped. The latest Japanese and American boats have, on an approximately equal tonnage, been armed with five 5-in. guns. This would seem to make them much more powerful ships. Yet their larger armament cannot be placed wholly on the credit side of the account. In a quick rolling and lively ship like a destroyer there is an effective limit to the size of shell that can be efficiently manhandled in a sea-way, and there are many experienced officers who think that the 5-in. shell is above that limit. Moreover, a 5-in. armament is a heavy one, and rumours of crankness which have been mentioned in connection with Japanese cruisers have been whispered in relation to their destroyers as well, particularly since the capsizing of one of their smaller destroyers a few years ago. On the whole, there is no reason to think that our destroyer fleet is other than satisfactory.

A point of special interest is of course to be found in the thirty French 2,500-ton boats, called by them destroyers and by the rest of the world light cruisers, which are of very high speed and armed with five 5·4-in. guns. In the present world circumstances, we can presumably afford to regard them as interesting hybrids rather than as active problems. Should their existence give rise, however, to extensive imitation, we should be forced to consider whether or not to follow suit.

ESCORT AND PATROL VESSELS.

Escort and Patrol Vessels are presumably intended to escort and protect trade. In that capacity, they may reasonably expect to have to deal with attacks by submarines, destroyers, and possibly cruisers. The latter they can hardly expect to be large enough to engage, while being sufficiently numerous for their special purpose, but they ought certainly to be superior to a destroyer. Most of our escort vessels are not, being only armed with two 4·7-in. or 4-in. guns against a modern destroyer's four 4·7-in. or 5-in. Even the latest "Bittern" class only carry four 4·7-in.* It seems therefore that we have, in these Escort Vessels, been building ships that are neither one thing or the other. They are not large or powerful enough to deal with reasonable surface attack, and with their low full-speed of 16–18 knots they are hardly fast enough to protect a fast convoy against submarine attack.

The criticism of inadequate size applies even more forcibly to the Patrol Vessels with their one 4-in. gun. These ships are analagous to the war time P-boat. The P-boat however was engaged in anti-submarine warfare only, the geographical and strategical conditions of the war making it virtually certain that they would not have to deal with German surface craft. The circumstances of another war may be entirely different. In a Mediterranean war, for instance, Patrol Vessels on convoy duty could hardly expect immunity from surface attack, and against any such attack as can be foreseen they would be almost helpless. What we seem to need for Escort and Patrol Vessels is a speed of 20–23 knots, a tonnage big enough to mount a 5·5-in. gun and a sufficiency of these weapons to keep at least a modern destroyer at a distance.

SUBMARINES.

There is little to be said about submarines. They are not designed to attack each other but other surface craft, and the torpedo is their main weapon. The boats we have and are building seem adequate for the purpose.

R. G.

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* Since the above was written, it has been made public that two of the latest escort vessels are to mount six and eight 4·7-inch guns respectively.

CHAPTER IV.

NEUTRALITY OR NON-INTERVENTION.

The intricacies of law seem to belong to a remote world of their own till one finds oneself confronted with the situations they are intended to meet. The past year has seen the advent of a new procedure in the form of Non-Intervention intended to meet the circumstances of the present civil war in Spain. In the phenomenon of a civil war there is, of course, nothing new. The practice of intervention, too, has many precedents—as, for instance, Queen Elizabeth's action in the war between Spain and the Spanish Netherlands, when in 1585 she sent an army of 6,000 under Leicester to help the Dutch, a policy which ended in the Armada and a war with Spain with no small influence on the history of England and of the world. The War of American Independence, again, was of the nature of a civil war in which France intervened, and the last century was equally prolific in such conflicts.

One of the most important was the long-drawn-out struggle between Spain and Spanish America (1809–24), which originated with Commodore Sir Home Popham's expedition in 1806 *; in this quarrel Great Britain pursued a uniform policy of avoiding any action which would cause offence to Spain †; and the United States in the same conflict followed a similar policy of neutrality, involving a recognition of belligerent rights. Thus in 1819 a decision of the United States Court, on the legality of an act of capture by one of the parties, stated that the Government of the United States having recognised " the existence of a state of civil war " between Spain and her colonies but remaining neutral, the " Courts of the Union are bound to consider as lawful those acts which war authorises." ‡ In 1823 Canning, convinced that Spain would never recover the allegiance of her dominions oversea, proceeded to appoint consular officials to South America to secure the safety of British trade, persons, and property. At the same time he proposed to the United States conjoint action in the event of intervention by European Powers, a proposal which took shape five months later in the form of the Monroe doctrine, announcing that the United States would

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* For which he was subsequently courtmartialled and severely reprimanded, having acted without orders. See *Naval Chronicle*, vol. 17, p. 209.

† Professor Herbert A. Smith ; " Great Britain and the Law of Nations," 1832, vol. 1, p. 136.

‡ John B. Moore's " Digest," 1906, vol. 1, p. 174, *cit.* " Divina Pastora " (1819) ; 4 Wheaton 52, 63 ; and President Monroe's message of March 8, 1822, extending to them rights as equal parties in a civil war.

not permit any intervention by European Powers in the American Continent.*

Another precedent is to be found in the conflict in Portugal in 1828, when Dom Miguel, after seizing the reins of government, declared a blockade of Oporto; this blockade was notified in the *London Gazette* on June 24, and the King's Advocate, Sir Herbert Jenner, pronounced a subsequent opinion (August 13) that the blockade of Madeira if effectively maintained might be recognised as valid, although no form of recognition had been conceded to Dom Miguel.† In this war there was a minor but not unimportant piece of private intervention on the part of Captain Sir George Sartorius, R.N., who being unemployed in 1832 was appointed by Dom Pedro to command his fleet ‡; he was succeeded in this post by Captain Charles Napier,§ who to avoid the provision of the Foreign Enlistment Act called himself Carlos de Ponza and in 1833 defeated Dom Miguel's ships and destroyed his power at sea.

A still more important precedent is to be found in the civil war in America (1861–65). When it broke out the British Government, after issuing a proclamation of neutrality (May 14, 1861), though not conceding any other form of recognition, instructed British Naval commanders that "a state of actual war existed," ‖ whereupon Vice-Admiral Sir Alexander Milne, the Commander-in-Chief on the station, issued instructions to his Captains "to exercise the strictest neutrality between the contending parties, both of whom are recognised by H.M. Government as invested with Belligerent Rights." "It would," he added, "be their duty to afford the greatest possible protection to lawful British commerce, but if blockades were effectually established" it would be "their duty to respect them." ¶

This concession of neutrality involving a recognition of belligerency was the cause of much ill-feeling between England and the United States, which might easily have led to war, for the Federal Government was much incensed at it "as a great wrong against the nation whose integrity is thus invaded." In the case of France the tension was not so acute, as the French Minister made it clear that it was only their "great commercial interests" in America that had constrained them to recognise belligerency. In the opinion of the United States Government it was the firm and conciliatory attitude of Admiral Milne "that did much at this difficult time to maintain harmonious relations." ** The proclamation of neutrality meant that belligerent rights, which are the necessary reciprocal counterpart of neutrality, were granted to both sides, and when the war came to an end the grant of these rights to the Southern States was also withdrawn.*

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* Canning to Rich, August 20, 1823, and President Monroe's message, December 2, 1823.

† H. A. Smith, *idem*, vol. 1, p. 299; and in "Some Problems of the Spanish Civil War," *British Year Book of International Law*, 1937, p. 19.

‡ His name was struck off the Navy List, but later restored.

§ Later Admiral Sir Charles Napier.

‖ H. A. Smith, *idem*, vol. 1, p. 302.

¶ Admiral Milne's instructions of May 30, 1861, are in "British Government and Neutral Rights," by Professor James Baxter (3rd) *American Historical Review*, October, 1928.

** Lyons to Russell, October 16, 1864.

These precedents, which might be multiplied,† are sufficient to indicate that the criterion of relationship in neutrality and in belligerency, its reciprocal counterpart, is not so much the procedure of formal recognition as the existence of actual fighting on a large scale, under centres of definite authority, involving the security of persons and property whose safety can only be assured by an attitude of neutrality. If there is a " war on," then the forces fighting are constrained by necessity into essential measures of war, one of which is the stoppage of enemy supplies and these necessities are not dependent on recognition of belligerency or whether the war is a civil war. The necessity simply exists and the recognition of it is evident in the cases given above, while in the case of civil wars in South America the occasions have been so numerous that it may be presumed that at Washington the forms are kept ready, so to speak, in a basket for immediate despatch.

There has arisen, however, in the last twenty years a current of opinion which amounts to a war upon war, and there is talk (not by jurists) of a new doctrine of neutrality in which there is to be no neutrality but every nation is at once to arm whenever a cloud of war appears on the horizon. The old conception of neutrality is regarded by some exponents of collective security as a mere condonation of war. A grave defect in this doctrine is that many of its disciples do not seem to have studied war. The study of disease (if war is a disease) is essential to the maintenance of health, and the study of war and the ways of war is essential to the maintenance of peace. The books on collective security (and they are legion) are full of what has been said in the Assembly of the League or in the Preparatory Commission for Disarmament, but very rarely tell us what has been actually done in time of war, and it is quite possible to meet persons learned in doctrines of collective security who have never heard of Admiral Sir Alexander Milne, much less taken the trouble to examine what he actually did in a time of civil war in order to maintain the peace. The vital deficiency of the more ardent pacifists is that they know very little about war. The exponents of new methods seem to be oblivious to the fact that the doctrine and practice of neutrality were born out of bitter necessity in the sixteenth century in order to dyke the floods of war and to confine them within the narrowest limits. Words like " piracy " do not help. For if there is a *de facto* government with a military force acting in accordance with the customs of war, then one is bound to recognise the existence of war.‡ It is in the light of these relevant precedents that we may view the present circumstances in Spain.

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* " H.M. Government are of opinion that neutral nations cannot but consider the civil war in North America is at an end " : Earl Russell to Lord Commissioners of the Admiralty, June 2, 1865. " Claims against Great Britain," 1869.

† H. A. Smith, *op. cit.*, Greek Rebellion, 1821–25, vol. 1, p. 281 ; revolt in San Domingo, 1864, vol. 1, p. 313 ; Spanish disorders, 1874, vol. 1, p. 320 ; war of Garibaldi, 1860, vol. 1, p. 300.

‡ See Sir J. Hardy's opinion (November 3, 1860) in the case of Garibaldi. " If her Majesty's Government considers that a Civil War actually exists," then it may recognise the validity of the Dictatorial Government. Also Moore's " Digest," vol. 1, p. 167.

These circumstances were exceptional, for both sides were receiving assistance from other states whose intervention it was thought might result in a large-scale war,* and here it may be mentioned that Calvo was of opinion that recognition in the case of civil war must depend on circumstances and on the attitude of neutral powers and on the care that they take to abstain from intervention.†

France had made an appeal for non-intervention (August 12, 1936), to which Great Britain readily assented, and under an agreement of August 28 the states ‡ subscribing were to prohibit the despatch of men and munitions to Spain.§ The intention of the agreement was excellent. Its aim was to prevent the spread of war and to secure co-operation among the Powers in a situation which threatened to become extremely serious. It did not, however, apply to the United States or to Mexico or to ships flying various other flags, such as that of Panama.||

Again, from the point of view of the doctrine of neutrality, if there was no war and it was merely a case of internal disorder, the procedure could be regarded as a severe restriction on the rights of the Spanish Government, who did in fact protest against it (September 25, at Geneva) as a departure from traditional procedure. On the other hand, if there was a " war on," the imposition of this ban was in the opinion of a distinguished jurist " in substance equivalent to a collective declaration of neutrality." ¶

It is, of course, entirely within the rights of neutrals to impose a ban on the export or carriage of munitions in their own ships and from their own territories,** and though such a policy would have affected Great Britain and France very badly in the late war, it has the great merit of diminishing the complications and difficulties that arise from the practice of visit and search and the interception of contraband supplies.

As a system of quarantining war the policy is not effective, unless all sources of supply are definitely closed, and was less successful, for from the first the Non-intervention Committee was faced with complaints of breaches of the agreement,†† so numerous that in December, 1936, Great Britain had to put forward a new plan for the supervision of ships bound for Spain, to be imposed at sea by a

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* " In a civil strife of this kind, the normal practice is to accord belligerent rights. . . . We have not done so in this instance because of the Non-Intervention Agreement " : Mr. Eden, House of Commons, December 1, 1936 (*The Times*).

† Calvo, " Le Droit International," 1896, vol. 4, p. 25.

‡ Practically all European states, including Great Britain, France, Germany, Italy, Portugal, Russia, and Turkey.

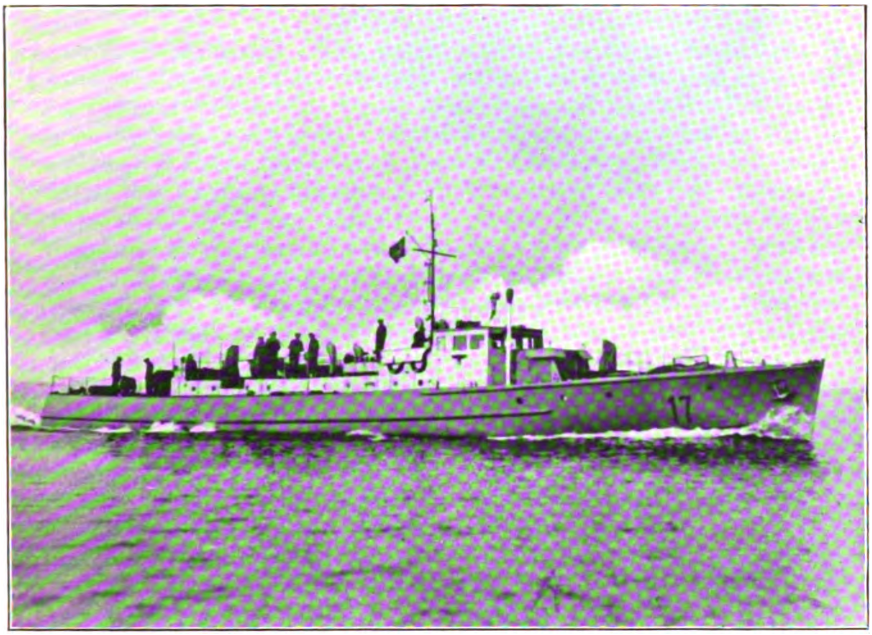
§ Great Britain had already passed an Act on August 19, 1936, applying to British vessels from ports in United Kingdom ; on December 3, 1936, extended to British vessels sailing from any port.

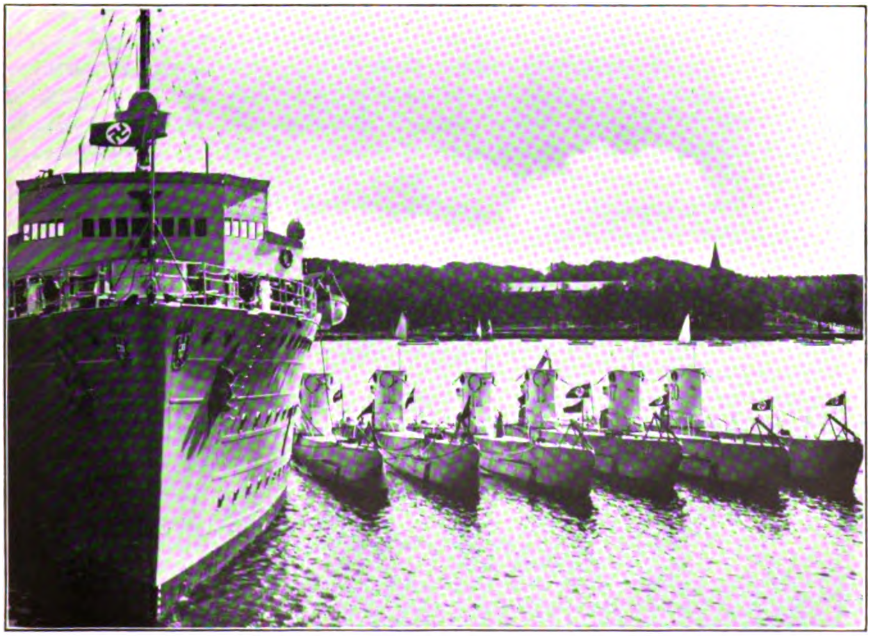
|| E.g. the Amalienburg, flying the Panama flag, carrying arms to Spain : *The Times*, July 20, 1937.

¶ H. A. Smith : " Some Problems," *op. cit.*, p. 28.

** See Laws of Neutrality in 1914 : U.S. Government, 1918.

†† *The Times*, October 10, 1936 : " There had been flagrant breaches of the Agreement," Mr. Eden, April 12 ; *The Times*, April 13, 1937.





(TOP) THE GERMAN MOTOR PATROL BOAT R 17.

Completed 1935.

(BOTTOM) GERMAN SUBMARINES ALONGSIDE THE TENDER SAAR.

(By courtesy of the German Navy.)

patrol of warships.* This patrol was in due course to go hand in hand with a ban on volunteers,† which was to come into operation on February 20, 1937. Under this system of control, all ships of non-interventionary powers bound for Spain were bound to call at certified ports (including the Downs, Cherbourg, Brest, Gibraltar, Marseilles, Palermo, Madeira, Lisbon), where "observing officers" ‡ were to be taken on board who would be a guarantee for the innocence of the cargo. Coastal zones § were established round the coast of Spain; where war vessels patrolling were to stop and identify (but not to search) any vessels belonging to non-interventionary powers, in order to ascertain if they were carrying out the orders laid down.

This system || came into force on April 19, 1937, and the non-intervention patrol was at first intended to ensure only that non-intervention vessels were obeying the law. At the same time it is possible to regard it from the Spanish point of view. It was a system of what may be called a supervisory or police patrol operating in what was actually a zone of maritime war. This is by no means a simple task. Suppose that in 1915 the United States, Norway, Sweden, Denmark, Argentine, Greece, and Chili had signed a non-intervention agreement and proceeded to station ships on patrol off Scapa Flow, Cromarty Firth, and the Forth. It may be doubted whether their presence would have been very acceptable to the Commander-in-Chief of the Grand Fleet, or indeed whether a system of this sort could be applied against a naval power.

Actually the combatants were both conducting a war at sea with the usual incidents of such a war. Between October 30, 1936, and April 10, 1937, eighty-four Soviet ships were stated to have been stopped and eighteen Danish vessels had their cargoes confiscated.¶ In April some seven Nationalist warships were watching the Bilbao coast and had sunk and captured at least two Spanish ships.** General Franco was closing in on Bilbao, and on April 10 announced that four British ships at St. Jean de Luz would not be allowed to enter Bilbao. A warning of mines was also issued, and on that account British ships were on April 12 specially advised not to proceed to Bilbao. The situation amounted to the enforcement of a blockade, the right of which had not been granted to him, and so the patrol system, originally intended to control non-intervention traffic, became extended to include the task of limiting General Franco's operations to territorial waters, and giving protection to any British ship which might suffer interference on the high seas.††

* *The Times*, November 28, 1936; January 2, 1937.

† Anglo-French proposal of December 24, 1936.

‡ The number 550 was given, under a Chief Administrator.

§ North of Spain (Bay to Cape Busto in Long 6° 30′ W.) British; north-west of Spain, France; south of Spain, British; Spanish Morocco, France; south-west of Spain, Germany; Barcelona Coast, Italy; Canary Is., British; Majorca and Iviza, France; Minorca, Italy: *The Times*, March 6.

|| French Decree, April 9; German Decree, April 9.

¶ *The Times*, April 29, May 6.

** Mar Caspio, about March 29, and Mar. Cantabrico, 6,680 tons, on March 9.

†† *The Times*, April 20.

Thus what was originally a policy of non-intervention tended to become a policy of restraint on the conduct of operations at sea. Incidents occurred. Three British ships ran the "blockade" on April 23, 1937, and H.M.S. Hood * had to request the Almirante Cervera to cease interference outside territorial waters, an issue complicated by the fact that Spain ever since the eighteenth century has consistently claimed a six-mile limit for territorial waters,† though in August, 1936, the Spanish Government had agreed to recognise the three-mile limit. Meanwhile the United States were pursuing a policy of strict neutrality, though no ban could be placed on exports in the case of a civil war. On May 1, 1937, however, the new Neutrality Law passed the Senate, and the President immediately declared by proclamation the existence of a civil war in Spain and placed a ban on the export of a number of commodities to the belligerents.

In Europe the plan for the withdrawal of all foreign volunteers was still being discussed at the end of May, while H.M. Ships were busily engaged in the humane work of evacuating a crowd of refugees. The patrol system, working in a zone of operations exposed the ships engaged in it to danger. H.M.S. Hunter was mined with a loss of eight killed (May 13). Bombs fell close to H.M.S. Hardy, and on May 29 the German Reichship Deutschland at Iviza was hit by bombs with a loss of twenty killed. This broke up the patrol system for a time, for Germany and Italy both withdrew from it. Negotiations followed with the parties in Spain to ensure the safety of patrol ships which resulted in an agreement of June 12 by which assurances were given to extend the areas of safety zones, after which Germany and Italy returned to the Committee and to the patrol (June 16).

Hardly had this been done when the German Reichship Leipzig reported three torpedoes fired at her by a submarine off Oran on June 15 and 18; and Germany and Italy, unable to get the other members to join in a naval demonstration, withdrew finally from the patrol system. They pointed out that much traffic was entering Spain under Spanish and other flags, and were in favour of granting belligerent rights at sea while maintaining the control of land frontiers where it could be properly exercised.

The system, which may be regarded as more or less experimental, has had to face a measure of criticism from jurists, who have pointed out that it was not based on any precedents or practice of international law.

A new British plan, proposed in July, suggested the grant of limited belligerent rights conditionally on the withdrawal of foreigners, and the replacement of the naval patrol by international officials in Spanish ports. It proposed, too, a list of contraband and that ships with observers flying the non-intervention flag should pass unmolested.‡ These proposals were evidently intended as an

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* The British patrol force at the time on the North Coast consisted of H.M.S. Hood, Shropshire, and five destroyers.

† The same point was consistently disputed by Norway in the late war. See "Extent of Jurisdiction in Coastal Waters," by Captain Christopher B. V. Meyer (Norwegian Royal Navy), 1937.

‡ *The Times*, July 15.

effort to ensure co-operation in a particularly difficult train of circumstances, though from the point of view of international law it has been argued with some justice that belligerent rights cannot depend on the presence of volunteers or on the composition of the forces concerned, for this would make belligerent and neutral rights depend on bargaining and not on fact and law.

There was much difficulty in the Non-Intervention Committee in deciding whether the withdrawal of volunteers should take priority over the question of belligerent rights,* while on the coast of Spain H.M. ships continued to protect all British trade outside territorial waters.† In August, 1937, attacks without warning were being made by submarines on Spanish and other vessels,‡ and orders were issued that British warships were to attack any submarine which should attack a British ship without warning §; on August 25 the Mediterranean fleet was reinforced to ensure such protection, and General Franco was told that attacks on British ships would not be tolerated. The attacks did not at once cease, for on September 1 H.M.S. Havock reported she was attacked by torpedo off the Mediterranean coast of Spain, and the same day the ss. Woodford|| was sunk in the same area and the Russian ss. Blagoeff in the Ægean off Skyros; whereupon four more British destroyers were despatched to the Mediterranean and France called for a Conference of the Mediterranean Powers at Nyon.¶

Great Britain, Russia, Greece, Egypt, Rumania, and Bulgaria accepted the invitation. Italy postponed her reply, as Russia had been suggesting that the submarines at work were Italian and not Spanish and had sent a note to Italy to that effect (*The Times*, September 7). Germany declined the invitation, considering that the whole matter should be dealt with by the Non-Intervention Committee.

When the Conference met at Nyon on September 10, it was agreed that the Mediterranean should be divided into zones for anti-submarine patrol and that France and Great Britain should be responsible for the West Mediterranean. Each country was to be responsible for its own territorial waters, and all submarines not conforming to the convention of November 6, 1936, which forbids the sinking of merchant vessels without due warning and consideration for the safety of passengers and crew, were to be attacked and sunk. The agreement was signed on September 14. It was of the nature of a collective measure of "armed neutrality" against attacks on neutral shipping. For its execution the British destroyer force in the Mediterranean was raised to thirty-eight destroyers and five flotilla leaders, assisted by two R.A.F. squadrons. It was decided about the same time (September 18) by the British and

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* *The Times*, August 3.

† E.g. H.M.S. Kempenfelt and ss. Macgregor; H.M.S. Royal Oak and ss. African Trader: July 25.

‡ Spanish ss. Ciudad de Cadiz, 4,602 tons, off Tenedos, sunk August 15.

§ Contrary to the Convention on Submarine Warfare, November 6, 1936, which was Part IV of the London Treaty of 1930.

|| Greek ship transferred to British ownership.

¶ *The Times*, September 4, 1937.

French Governments to discontinue the naval patrol off the Spanish coast,* which brought the system of coastal control to an end. There followed three-power naval talks in Paris (Great Britain, France, and Italy) as to the measures to be adopted against submarines (September 27). The proceedings of the Conference were hampered by Italy's disinclination to join in it without the attendance of Germany, where the " Rome-Berlin axis " had been strengthened by Signor Mussolini's visit to Berlin on September 24, and by her final reply on October 10 declining to take any part in it. The Conference had barely begun when the destroyer H.M.S. Basilisk, on October 4, reported being attacked by torpedo by a submarine off Cape San Antonio on the Mediterranean coast of Spain, to which she retaliated with depth charges, though it was subsequently found that no attack had been made. This was the last attack by submarines, whose operations were brought by the Nyon conference to an end.

In the Non-Intervention Committee the deadlock between the proposals for the withdrawal of volunteers and the grant of belligerent rights, which had lasted since July, continued; while in the East the guns were thundering outside Shanghai and at Brussels the Far Eastern Conference was preparing to meet (November 3).

The basis of the conception of neutrality lies in the necessity of a definite procedure for the conduct of normal trade and the security of neutral property and subjects; these considerations were becoming more and more urgent, and negotiations were in progress for the exchange of consular agents with General Franco, in which the British Government asked for and obtained the release of seven British ships under detention.† What was virtually a blockade of the coast had not, however, been recognised by Great Britain, whose patrols continued to protect British ships from interference outside and to warn them of the risk of proceeding inside territorial waters.

On December 1 recognition was accorded by Japan to General Franco's regime. The situation in Spain was being overshadowed by that in the Far East, but in both cases one of the main points at issue was the status of neutral ships and subjects within a zone of fighting. On December 6 General Franco issued a note announcing an intention to tighten the blockade in the Mediterranean, though Great Britain had not yet recognised his right to enforce any blockade at all. On December 11 Signor Mussolini announced Italy's decision to leave the League, leaving in it only two naval powers of consequence—Great Britain and France.

In the system of non-intervention can be seen an endeavour to maintain a policy of strict neutrality by prohibiting the export and carriage of munitions of war, which it was hoped would put a stop to intervention. The hope was not fulfilled, and in this respect the scheme did not attain its object.‡ It succeeded, however, in localising the conflict, and if it was not able to stop inflammables being thrown into the blaze, it at least prevented the flames spreading to adjacent areas. The decisions, too, taken at Nyon put a stop to submerged attacks by submarines on neutral vessels.

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* *The Times*, September 18.

† Including ss. Mirapanu, detained July 24; Caper, August 10; Bobie, October 3; Dover Abbey and Yorkbrook, October 5.

‡ Mr. Chamberlain, Edinburgh, November 12.

A malignant influence affecting these situations is the fervency of the emotions that arise whenever fighting starts. Wells of sentimentality burst out of kindly warlike hearts and, unrefined by any study of war or history, cover the question at issue with a welter of oily confusion.

It is a matter of regret that so little is done to lay the foundation of a study of war. The present occasions in Spain have confirmed the experience of the past that, whenever a war is being waged, a neutral state is bound to consider the probability of its merchant vessels, naval officers, and consuls being involved in sudden complications.* It is in this consideration that the essence of neutrality lies.

America has had much experience in the diplomacy of civil wars, and in the opinion of the American jurist Wheaton it is desirable to issue at first a simple declaration that the contest is, or is not, to be treated as of the nature of war. Then, according to what may be termed Mr. Adams' rule, "after the lapse of a reasonable period with little prospect of termination of the struggle, especially if this be carried on upon the ocean, a recognition of the parties as belligerents appears to be justifiable." †

In the case, however, of the present war in Spain, the position has had to be governed by the policy of non-intervention, which has resulted in a form of what may be termed "limited belligerency," in which operations of blockade and search have been restricted to territorial waters. That the operations on the Spanish coast do actually amount to a blockade there can be little doubt, for the detention of foreign vessels for carrying contraband cannot be justified on any grounds of municipal law. A limitation of belligerency to particular areas or particular acts may quite conceivably become a recognised principle of international law and has indeed already a place in it,‡ but it is desirable that any such practice should be based on definite juristical grounds and be kept distinct from the idea of abolishing war by placing restraint or restrictions on the operations of war by sanctionary methods. The policy of non-intervention is admittedly experimental and the measures appertaining to it have found their justification in the fact that they have been effective in localising the contagion of war and in producing a "perceptible lessening of tension" in Europe. In these measures the British Navy has played no small part, and has been as potent as ever in supporting diplomacy and in preventing the oncomings of war.

A. C. D.

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* Wheaton (Dana, 1866), s. 23. See, too, any Neutrality Proclamation, as for instance April 23, 1898, in Spanish American war: "Whereas great numbers of our loyal subjects reside and carry on commerce . . .".

† Wheaton, *idem*, s. 34. Correspondence, Mr. Adams and Earl Russell, April to September, 1865.

‡ "International Law in Spanish Civil War," James W. Garner: *Amer. Journal of Int. Law*, January, 1937.

CHAPTER V.

THE ROYAL ITALIAN NAVY.

BY REAR-ADMIRAL LUIGI SANSONETTI, R.I.N.

NEW DEFENSIVE DUTIES FOR THE ITALIAN NAVY.

SINCE the last time that " Brassey " dealt in particular with the policy of the Royal Italian Navy, viz. in 1930, the Fleet of this nation has made considerable progress, fully carrying out the programme then described and even developing it further in accordance with increased necessities.

The defensive duties then outlined have been considerably modified in the meantime by two facts: the " battle for grain," which has since developed into the more general " battle for autarchy " ; and the conquest of the Ethiopian empire.

In the 1930 " Brassey " Captain de Courten outlined with figures and diagrams the position of extreme dependence on the sea-routes in which Italy found herself, particularly in regard to the indispensable supplies of grain and fuel, that are the two principal sources of the individual and collective life of the nation. Enclosed in the beautiful but small Mediterranean Sea, this wonderful and temperate peninsula, too small for its overcrowded population, was obliged in the past to rely for several months every year on its supplies of bread from overseas. Industry, agricultural machinery, land, and maritime transport, which were rapidly increasing through the creative energy of an industrious people free from social conflicts and united in one group under the leadership of a farseeing and beloved Chief, had to obtain their indispensable supplies of fuel from abroad. Enclosed in an inland sea whose outlets were and are controlled by others, Italy was obliged to give to her Navy a very difficult task, which hampered many of its possibilities of action.

For this reason the tenacious work, dictated by the Duce, of improving agricultural output, which in ten years has succeeded in increasing by 50 per cent. the normal production of cereals per hectare, has been rightly called first the " battle " and then the " victory of the grain," since, by this victory one of the most important problems that would have faced the Navy in case of war has been solved and eliminated for ever.

This success has further stimulated national activity in its effort to free itself from foreign dependency on fuel as well as on other raw materials. The sanctions imposed upon Italy during the Ethiopian war have tested the system, and under the spur of necessity progress has been made which could not have been imagined in the past.

To-day Italy is at the head of all other nations of the world in utilising hydraulic power for transport and industry; modern hydrogenating plant enables her to utilise fully the output of coal of poor quality from the mines in Sardegna and Istria, which in the past were worked in a very modest way; Albanian petroleum is imported with a minimum of sea transport and sent to factories established in the peninsula; the search for petroleum which is being assiduously conducted and the new methods of utilising bituminous schists give her new and well-founded hope of reaching a sufficient independence in this field also. Further progress, sometimes almost miraculous, has been made in other fields in the fight for autarchy; to give only one example, taken at random, a kind of warm wool, white and soft, is now obtained on a large scale from the residues of milk and its products.

All this activity is closely connected with the possibility of solving the military problem in general and the naval one in particular. It is therefore easy to understand why at the head of the organisation which is carrying on this brilliant struggle and which is called the "Consiglio Nazionale delle Ricerche" (National Council of Research) the Duce had placed from the first that great scientist Guglielmo Marconi, who was a Rear-Admiral of the Italian Navy, and, after his death, Marshal Badoglio, Chief of the General Staff of the Fighting Forces.

If, however, from this point of view, the responsibilities of the Italian Navy have been reduced to a quite bearable magnitude, they have been greatly increased by the conquest of the Ethiopian empire.

This immense region, which up to the time of the Italian conquest had been left in the most backward state of abandonment, is capable of representing in the civilised world a strong factor of production and welfare. Italy disposes of an abundance of men and has the necessary organising capacity to carry on rapidly this work, which will prove beneficial to all. It has, in fact, already been started with great energy. The Italian Navy has the duty of contributing to this work by safeguarding the communications with the mother country, and every nation which possesses colonies is well aware of the meaning and importance of this task.

By freeing the old small colonies of Eritrea and Somaliland from the ever-present Shoan menace, Italy has also acquired for the first time, even if in an indirect way, a real outlet to the open sea. Countries such as England, France, and the others which possess an ocean coastline have always enjoyed this privilege; they are used to it and therefore they can hardly appreciate the satisfaction and the feeling of reconquered freedom that is now felt by the Italian people.

On the other hand, this outlet to the open sea represents for the Italian Navy the beginning of heavier responsibilities. The Italian Empire has sufficient resources to be self-supporting and can furnish men and materials along its coastline sufficient for all eventualities; but if this fact means that the problem set to the Italian Navy can be solved, it means also that the task of the Italian Navy has been considerably augmented.

For this reason the increased rhythm of expansion of the Italian

Fleet should cause no surprise; this expansion does not indicate aggressive or provocative intentions, but is only the logical consequence of the greatly increased defensive necessities, necessities which must be met in order to safeguard the work of a whole generation.

ITALY AND THE LIMITATION OF NAVAL ARMAMENTS.

"Brassey" published an article on the Italian naval policy in 1930, on the eve of the London Naval Conference, in which Italy took part, as she also took part in the conference of 1936. Since then Italy has been faithful to the policy of limitation of armaments based on the suppression of the more specially offensive arms and on parity among the European Continental powers. In spite of some particular circumstances, the Italian contribution to the 1936 conference was willing and effective; as the Vice-President of the Conference, Lord Monsell, has testified. Italy greatly contributed to the solution of many of the difficulties that arose during the proceedings. Although the particular circumstances then existing and some differences on technical matters did not allow her to sign the agreement for the qualitative limitation of future naval constructions that was reached at the time among the other Powers, Italy has kept her construction within those limits by not exceeding the 35,000 tons limit for her capital ships, by building only 8,000-ton cruisers with 6-inch guns, 1,500-ton destroyers, and submarines under 2,000 tons.

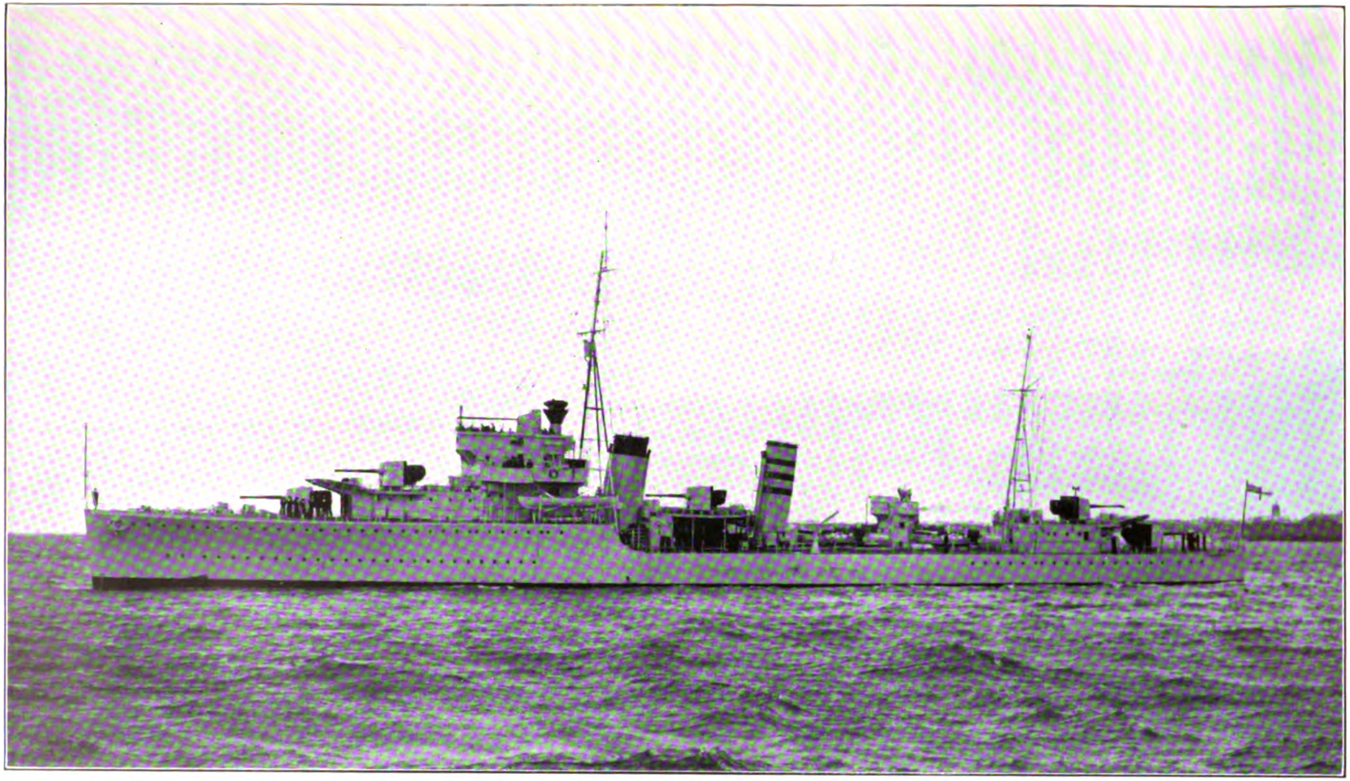
In practice even the quantitative proportion established at Washington for capital ships in respect of Italy, France, Japan, the United States, and England, viz. 5 : 5 : 9 : 15 : 15 respectively has been reached and maintained. Even if we consider the programme of construction recently announced and compare it, for instance, with the British programmes up to 1938 inclusive, it will be seen that the above-mentioned proportion has been more or less maintained.

THE DEVELOPMENT OF THE FLEET.

CAPITAL SHIPS.

Whilst the Washington Treaty was still in force, Italy had acquired since 1927 the right to begin the construction of capital ships within a total of 70,000 tons. The same right had also been acquired by France, which in 1932 took advantage of it and laid down the first of the 26,500 ton battleships of the "Dunkerque" type. On the other hand, Italy confined herself to thoroughly modernising two of her four 23,600-ton ships of the "Cavour" type.

The Head of the Italian Government gave his approval to this work of modernisation only because it meant a radical transformation, and not only a work carried out in half measures. Anything existing on board that had in any way lost its efficiency, either through usage or because it had been surpassed by more up-to-date devices, had to be scrapped and replaced.



H.M. FLOTILLA LEADER INGLEFIELD.

Commissioned for Service, June 25, 1937.

(By courtesy of the builders, Messrs. Cammell Laird and Co., Ltd., Birkenhead.)

Consequently, the sum spent on this transformation was much higher than the one which is usually allocated to such works of modernisation. But this sum was very well spent, because with the cost of one new ship Italy has obtained two ships of approximately the same efficiency. The internal structures of the hull were thoroughly rebuilt according to the most modern conception of under-water protection; the machinery was completely rebuilt, reproducing and improving the excellent 90,000 h.p. plant on two shafts, already satisfactorily tested on four cruisers of the "Zara" type and on six cruisers of the "Condottieri" type.

In the same way, the well-designed hulls, which were designed in 1911 and could not be better conceived to-day, have been maintained, because it was possible to provide the new under-water protection without altering them. In this way it has been possible to reach a full-load speed even higher than the 27 knots planned. Furthermore, in the last twenty years the manufacture of armour-plates had not made such progress as to render in any way obsolete the excellent lateral armour of these ships. Also the heavy artillery has been kept, but a daring innovation, completely successful, has made it possible to increase the calibre from 12 to 12·6 in.; the technical authorities are also extremely satisfied with the new ammunition, which has been prepared in accordance with the latest conceptions. The secondary armament, anti-aircraft armament, conning tower, director tower, and the superstructures in general have been completely replaced by new.

A full appreciation of the value of these ships, as soon as they were recommissioned, suggested the immediate reconstruction on the same basis of the other two ships of the same type, the Doria and the Duilio.

Naturally, in these two large ships, the first to be taken in hand after so many years of naval holiday, some particular point of secondary importance might have been improved, but here again a further advantage has resulted from this decision to reconstruct, for the experience gained has made it possible to eliminate some details which might have been subject to criticism in the construction of the two large capital ships Littorio and Vittorio Veneto, which were launched in July, 1937.

Few particulars are so far available regarding these two 35,000-ton ships, whose construction was sanctioned by the Duce in 1934. It is known only that their speed will not be less than 30 knots and that they will mount 15-in. guns. It is also known that special attention and care has been given to providing the best possible vertical, horizontal, and under-water protection.

The two new capital ships recently ordered, the Roma and the Impero, will naturally derive further advantage from the experience so far gained.

Therefore the Italian Fleet, which up to the middle of 1937 consisted practically of light craft and submarines only, in the last few months, with the recommissioning of the two "Cavours," has acquired a small squadron of battleships which, in view of its speed, decidedly higher than that of any other armoured-ship now in existence, with the exception of the three British battle-cruisers and of the two French " Dunkerques," increases in a great measure the possibilities of action of the entire Fleet.

During 1939, with the recommissioning of the two " Doria " battleships, this small squadron of battleships will be brought to the strength of four units, that is, a complete tactical division. Soon afterwards the two " Littorios " will enter into service, forming thus a battleship strength of considerable speed and power.

Towards 1941 there will be two battleship divisions tactically complete, consisting of four units each ; the four " Cavours " with a displacement of 24,000 tons, a speed of over 27 knots, and mounting 12·6-in. guns ; and the four " Littorios," displacing 35,000 tons, with a speed of over 30 knots and mounting 15-in. guns.

CRUISERS AND LIGHT SURFACE CRAFT.

The building of the modern Italian fleet of light surface craft began in 1923, after the advent of Fascism. From that time on it has been developed in accordance with a well-thought-out programme which has produced a well-balanced and harmonious fleet.

It comprises a division of fast 10,000-ton cruisers mounting 203-mm. guns—the three " Trento " type cruisers—whose effective speed of over 36 knots is decidedly superior to that of any other similar vessel.

Besides, there is a division of four vessels of the same displacement and mounting the same calibre guns—the " Zara " type—whose speed has been reduced to 32 knots in order to give a greater structural strength and a greatly extended armour-protection. On their sides the thickness of the plates is approximately 6 in., which is more than the armour-plating of any other similar ship. This seeming miracle is due to the daring adoption of a propelling machinery of approximately 90,000 H.P. on two shafts only, an innovation which has met with such complete success that, after having been fully tested by working experience, it has been repeated on the two reconstructed " Cavours," which have also derived considerable advantages from this arrangement.

In addition to these seven 10,000-ton cruisers, equal in number, in size, and in armament to those belonging to France, which is the other European Continental Power possessing a Mediterranean coastline, the Italian Fleet possesses six cruisers of 5–6,000 tons displacement—the " Condottieri " class—endowed with great speed and mounting eight 6-in. guns, and six cruisers of 7–8,000 tons displacement, mounting some eight and some ten 6-in. guns, in which the speed has been somewhat reduced in order to obtain a stronger structure and better protection.

With regard to the light surface craft the Italian Navy has developed and will continue to develop three fundamental types : the *esploratori*, the *cacciatorpediniere*, and the *torpediniere*. The *esploratori* correspond, as far as tonnage is concerned, partly to the British flotilla-leaders and partly to the French *contretorpilleurs ;* the *cacciatorpediniere* correspond exactly to the British destroyers ;

and the *torpediniere* are smaller vessels of approximately 700 tons displacement.

The first modern *esploratori* were the three " Panteras," with a displacement of 2,000 tons and a speed of 35 knots ; subsequently the twelve " Navigatori " type vessels were built with a displacement of 2,100 tons and a speed of 37 or 38 knots ; now Italy has begun the construction, which will probably be carried on very rapidly, of twelve new vessels of a greater displacement, sufficiently large to improve their radius of action and seaworthiness.

These *esploratori* have so far been used mostly in conjunction with fast light cruisers, and it is possible that the satisfactory experience gained with them was a decisive factor in deciding the construction of twelve new vessels of this type.

The destroyers in commission are thirty-two, with a displacement which has been gradually increased from 1,100 tons of the " Sella " type to the 1,500 of the " Scirocco " and " Oriani " types. In these last-named vessels are embodied all the improvements dictated by the experience gained with the preceeding vessels and the young officers in command are extremely satisfied with them. In fact, the construction of these vessels has been eminently successful both as regards the balance and the safety of the various requirements, none of which has been carried to its utmost limit. Twelve further vessels of the same type, the " Camicia Neras," will be in commission within the present year.

The torpedo boats are a reproduction on a smaller scale of the " Scirocco " type vessels. These torpedo-boats, of which there are so far twenty, but which in the near future will reach the strength of thirty-two units, are particularly suited to the country's needs in certain zones of limited area but of great strategic importance, where Italy possesses numerous bases. In addition to these vessels there are several others of the same type which were built during the War or in the immediate post-War period, and which are still quite efficient. Among other uses, these craft are employed in the " Naval Command School " for the instruction of young officers who will be entrusted with the command of modern light surface craft.

With the torpedo boats it is necessary to mention here the motor torpedo-boats (the " M.A.S."), those high-speed motor-boats which during the last War played such a brilliant part in many naval episodes in the Adriatic, to which the Italian Navy has remained faithful and which are copied to-day by many other navies. It is customary to build every year a certain number of these motor-boats, whose design is continuously improved upon, while the specialised dockyards are always ready to reproduce them in great number.

SUBMARINES.

In the last few years the Italian Navy has greatly developed her submarine craft. Very soon she will have in commission a number of submarines greater, at least for some time, than that possessed by any other navy: that is, about 100. Some naval critics find it fashionable to-day to undervalue the submarine. In practice, however, if anti-submarine devices have made great progress, the same can be said of submarine construction, of their machinery, their armaments, and their equipment. In addition, the particular characteristics of the zones in which Italy may have occasion to defend herself from outside attacks are suitable for the employment of submarines according to modern conceptions. New progress which is being made in the instruments necessary for the efficient use of submarines is such that the Italian naval command can place every reliance in these vessels. In this class of vessels as well, certain types have been evolved with which the commanding officers are fully satisfied and which can now be reproduced in large numbers.

AERIAL CO-OPERATION.

It will be noticed that the aircraft-carrier, that type of ship to which other navies attach a great importance, is not included in this review. This fact does not mean that the Italian Navy does not believe in the great fighting possibilities of modern aviation. However, the particular geographical conditions of the most probable theatres of action permit the Italian naval command to rely on the wide co-operation of air units operating from their land bases in the peninsula, in the islands, and in the African provinces, even if the Fleet does not possess any floating bases.

In this particular field Italian naval policy has been anticipatory, because, relying on the easily foreseen rapid progress of aviation it has abstained from incurring large expense in building a type of vessel which, in view of Italy's particular strategic problems, seems not to be indispensable.

Besides, if up to a short time ago a few dozen aeroplanes, such as can be carried by an aircraft-carrier, could be thought a considerable contribution of strength, to-day the vertiginous numerical expansion of aerial formations and recent practical experience lead to totally different conclusions. To-day it can be asserted that the only really promising air actions in naval warfare must be carried out by a mass or, better still, by large masses of aircraft. How many aircraft-carriers would be required for this purpose? Besides, in view of the fact that, for instance, the whole Mediterranean is well within the range of the Italian air-bases, would it be worth while to allocate for a non-essential purpose a considerable part of the not unlimited resources that Italy can dedicate to the building and the maintenance of her Fleet?

In her particular circumstances the question can be solved by other means: by the co-ordination between the fighting forces. Ahead of any other Government the Fascist Government of Italy has created unity of command by the institution of special permanent co-ordinating bodies, the "Commissione Suprema di Difesa" (Supreme Committee of Defence) and the "Capo di Stato Maggiore Generale" (Chief of the General Staff). And the fusion of all the forces material and moral is guaranteed by the fact that the three

Ministers of war, navy, and air have been placed under the strong and reliable leadership of the Duce.

NAVAL PERSONNEL.

The expansion of the Italian Fleet has naturally been accompanied by an increase of naval personnel. The number of officers has been brought from under 3,000 to over 5,000 and the number of petty officers and ratings, which in the 1930 naval estimates amounted to 44,000, has been raised in the current fiscal year up to 70,500.

This considerable increase of personnel has put many problems to the Italian Navy in regard to the accommodation and to the needs of the various schools required for the training of officers and specialists. All these difficulties have now been overcome. The only difficulty that would have been unsurmountable, if it had occurred, would have been the absence of a sufficient number of young men willing to join the Navy. On this particular point, however, the most comforting experience has been obtained. The more men the Navy requires, the more youths are ready to join. For every vacancy existing at the Naval Academy (there have been 200 this year) there were more than six competitors who had already passed the selecting committees of the Higher Secondary schools. For every vacancy for voluntary specialisation of long-term ratings there are at least four or five applications, amounting to a total of many thousands every year. The supply of conscripts, in spite of the fact that the classes under the colours are those born during the last War, has been and is continuously increasing; this fact is due principally to the excellent results of the organisations for pre-military instruction, during which a young man may ask for naval training, in order to serve in due time his conscript period in the Navy.

When we consider that the obligatory naval conscription is for two and a half years, whilst the conscription in the Army lasts only eighteen months, and that the conscript sailor does not receive appreciably higher wages than the conscript soldier, we must recognise that this influx of young men into the Navy appears in truth a return to the old vigorous traditions of Rome and of the sailor republics of Genoa, Venice, Pisa, and Amalfi.

This desire and this longing to serve the country on the high seas is a great factor of efficiency in the Italian Navy. The study of old glorious achievements, the conviction that the power of ancient Rome was consolidated only after it had been affirmed on the sea, the re-evocation of the enterprises of the great Italian sailors of the Middle Ages, and the recollection of the eight centuries of uninterrupted naval victories of the Venetian fleets, when the Lion of St. Mark left its strong and indelible imprint throughout the Mediterranean, fill with enthusiasm the Italian youths who, under the Fascist regime, are educated from the earliest age to the unlimited cult of their country.

The natural consequence of all this is a strong militaristic spirit, a deep desire and a deep longing, that can be controlled but cannot be suppressed, to have the opportunity to prove that our new generations are worthy of the old ones and to deserve that the rostral-column should be considered not as a ruin of the past but as the living symbol of the present.

In these sentiments and in this preparation of the hearts and souls of the younger generation lies the greatest strength of the Italian Navy of to-day.

LUIGI SANSONETTI,
REAR-ADMIRAL.

CHAPTER VI.

LOWER DECK TO QUARTER DECK.

1818 TO 1937.

THE year 1937 witnessed the twenty-fifth anniversary of the institution of the modern system of early promotion from the lower deck to commissioned rank. Unlike the Army, in which commissions have always been possible early in the careers of the rank and file, as distinct from long and zealous service awards, early promotion had lapsed in the Navy for nearly a century.

Promotion from mess deck to wardroom was no uncommon occurrence before and during the Napoleonic wars, and several of these "tarpaulin" officers reached flag rank. It ceased in the peace reaction which followed, the last "tarpaulin" commission being issued in 1818 to an able seaman who reached flag rank and retired as Admiral of the Red Sir John Kingcome, K.C.B.*

The warrant officers pressed for the resumption of commissions for lower-deck entries without success.† Lieutenancies for gallantry in action were authorised in 1852, but none was awarded for thirty-four years, when two chief warrant officers were promoted in the Golden Jubilee honours list. It was not until thirteen years later that two others won lieutenancies for meritorious service in the Boer War. Of the four only Lieutenant T. J. S. Lyne received further promotion.

Prior to this, in 1890, the warrant officers appealed to be allowed to take the sub-lieutenants' examination for promotion, a claim which was later altered to one for long and zealous service lieutenancies. These, however, were not granted until 1903. The number was 4 per cent. of the chief warrant officers, giving 100 among the executive, engineer, and carpenter officers—the only branches in which warrant rank was then possible.

The national education scheme inaugurated in 1870, with its many developments, had so greatly raised the standard of the people three decades later that many who passed through the national schools were, in an educational sense, capable of attaining to the higher positions in the professions. In 1906 the improvement in education was beginning to be appreciated. The Admiralty just previously had instituted an advanced class to train outstanding boys in order to produce a higher standard of petty and warrant officer, and an educational test for petty officer was introduced in September, 1907. It is of interest to note that, though for many years nothing but blank forms had been forwarded, it was not until this year that the Admiralty abolished the periodical return of seamen "unable to read and write"!

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* Admiral of the Fleet Sir Edward H. Seymour, writing of his appointment in command of the old paddle-wheel steamer Waterman in China in 1861, remarks: "The only further officers given me were a second master, equal to acting navigating sub-lieutenant, named Sherwin, who had just been promoted from ordinary seaman in the flagship, a most unusual proceeding."—"My Naval Career and Travels," p. 96.

† See "Brassey" 1937, Chapter VII.

Promotion from the lower deck had received much attention in Parliament and the Press, particularly in 1890 at the time of the warrant officers' appeal, and also in 1895 and 1898, when the Admiralty appealed to the Mercantile Marine for Royal Naval Reserve officers to transfer to the Navy. That year, the late Mr. Lionel Yexley started *The Bluejacket and Coastguard Gazette.* From the outset he waged a vigorous campaign, in that journal and elsewhere, for *bona fide* lower-deck promotion at an early age, as distinct from the warrant officers' claim for promotion *via* warrant rank. He continued to do so in *The Fleet,* which he founded in 1905, and the subject became one of keen controversy in the general as well as the Service Press.

In 1903 the Selborne-Fisher common-entry cadet system was introduced. This was largely the work of Admiral Sir John (later Lord) Fisher, whose views on excluding "all but a very small fraction of the population from serving the King as naval officers" are now well known. He wrote:

> "Officers . . . will be drawn exclusively from well-to-do classes. Democratic sentiment will wreck the present system in the long run, if it is not given an outlet. But let us take the far higher ground of efficiency: is it wise or expedient to take our Nelsons from so narrow a class?" *

His solution was to make all naval education a charge upon the State.

Though largely responsible as Second Sea Lord for the long and zealous service lieutenancies, Sir John Fisher's views on lower-deck promotion are not so well known, but they are on record. On January 13, 1910, twelve days before he left the office of First Sea Lord, he wrote to Mr. Yexley:

> "Unfortunately for them, [the lower deck] my departure has been precipitated by political events and I cannot expect my successor [Admiral Sir Arthur K. Wilson] to have quite the same enthusiasm as I sincerely felt on their behalf. The lower deck richly deserves all we can do. . . . Our warrant . . . and petty officers are competent for much higher positions . . . and for the good of the Service their status must be raised. I have left a memoranda on this subject." †

Six months later, in retirement, he wrote to Lieutenant Capper, for long one of the warrant officers' champions:

> "The warrant officers . . . are worthy of a far larger number of lieutenant commissions . . . and should be eligible for commander's rank. I hope it will come before an undesirable agitation compels it. The agitation won't come from inside the Service, but will be irresistible from without, and other things will come with it perhaps. 'A stitch in time saves nine.'" ‡

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* "Records," p. 160: "State Education in the Navy." An expurgated reprint of one of Fisher's "Strictly Private and Secret" documents for the Admiralty, headed "State Education in the Navy—being Part of the Education Vote and not for the Navy Estimates." An unexpurgated but not complete reprint appeared in *The Fleet,* March, 1921, p. 36.

† *Hampshire Telegraph and Post,* March 23, 1923, in an article by Yexley.

‡ Autobiography of Lieut.-Commander H. D. Capper, R.N.; "Aft from the Hawsehole," p. 260.

ENGINES AND BOILERS FOR THE ARGENTINE CRUISER LA ARGENTINA.

(By courtesy of the builders, Vickers-Armstrongs, Ltd., Barrow-in-Furness.)

Yexley, who was consulted by and in the confidence of Sir John Fisher, was satisfied that, had the latter remained First Sea Lord, a scheme for early promotion would have been introduced in 1910.

During the Navy Estimates debate in the House that year (1910), Mr. G. N. Barnes,* Labour M.P., questioned the First Lord (Mr. R. McKenna) regarding his attitude to proposals enabling poorer boys to enter as officers, either by cheapening the cost at Osborne College or by granting scholarships to Board School boys. The First Lord denied any desire at Whitehall to debar clever lads of humble birth from the quarter deck, and said that the Admiralty had invited County Councils to establish naval scholarships, but without result.

The Navy was astounded at this scholarship idea, and a storm of adverse criticism arose, not only on the lower deck and in the warrant officers' mess but also in the wardroom. This resentment found full vent in a flood of discussion in the Service and general Press. Almost unconsciously, the Service had slowly but surely grown ready to adopt a genuine system whereby ratings could rise to commissioned officer and be put approximately on an equality with cadet entries. It was thought that this embryonic system was threatened by the scholarship proposal and it was suggested that a notice be put up over the recruiting offices: "Only second-rate men required. First-class men apply at the Board School." †

Practical proposals were put forward in many places and from all ranks. All favoured "lower-deck promotion," and many advocated petty officer to lieutenant, but side issues were dragged in, according to the outlook of the individual, e.g. commissioned officers contended for the avoidance of a further block in promotion to commander and warrant officers for improved status and promotion.

The scheme which found most support was drafted by the late Lieut.-Commander N. F. Usborne, R.N., in consultation with Yexley and published in *The Fleet*, October, 1910, with the heading "Scheme for the Promotion of Petty Officers to the Rank of Lieutenant." The main points were:

Petty officers and leading seamen to be eligible.
Age limit on selection to be 26.
Promotion to acting warrant officer.
Preliminary course of instruction.
Courses with sub-lieutenants.
Promotion to lieutenant.
Ante-dating of seniority, according to certificates obtained and by other ante-dates, to get the officers on a par, as regards seniority for age, with cadet-entry officers.

There was no question of a separate rank and title, promotion to lieutenant was to be direct from warrant officer and assimilation to commence from the outset. The scheme was reputed to have the support of Sir John Fisher and Mr. McKenna, but with the departure of the former from the Admiralty, the Selborne-Fisher scheme, and other controversies,‡ the First Lord was reluctant to commit himself.

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* Pensions Minister, 1916–18 and Member of War Cabinet, 1917.

† Yexley, "Our Fighting Seamen," (1911).

‡ The Lords threw out the Budget and there were two General Elections that year.

Next year Mr. Winston Churchill became First Lord, bringing new enthusiasm to the Admiralty for the principle of lower-deck promotion.

THE MATE SCHEME.

When, five months later, Mr. Churchill introduced the Estimates for 1912, he made the first announcement concerning the Mate scheme:

> "These are the days when the Navy . . . should be opened more broadly to the nation as a whole. The question . . . is fraught with difficulties. We have thought them well over, and we are agreed . . . that there are no difficulties which . . . cannot be and ought not to be overcome. We propose therefore to select a considerable number of the younger warrant officers, by yearly instalments of twenty-five to thirty, up to a total of one hundred, possibly more, for promotion to the rank of commissioned warrant officer, a rank which . . . is equivalent to . . . sub-lieutenant. . . . They will of course be eligible for promotion, strictly according to their merits, to the higher ranks. As however they will start as commissioned officers some years later than those who enter . . . through the naval college, it is probable that the great bulk . . . will retire content with a career which will have carried them from bluejacket to commander. If this should in practice result . . . we shall have made the necessary additions to the lieutenants' list without producing the block in promotion to the higher ranks which would otherwise be inevitable. . . .
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> * * * * *
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> "As the promotion of . . . younger warrant officers may be thought to affect somewhat hardly the warrant officer of many years' service, it is proposed to concede . . . what they have so long desired—namely, promotion to the rank of commissioned warrant officer after 15 years' as warrant officer, instead of after some 20 years as now. . . ."

This last concession resulted in over 200 being promoted to chief warrant officer, to date April 1.

At its face value the scheme appeared to be a genuine attempt to provide both commissions and promotion to the higher ranks; in fact, several papers hailed it as an avenue to flag rank. Actually it was a compromise between claims on behalf of young petty officers and those of warrant officers. Instead of promoting petty officers to lieutenant with ante-dates to bring their ages on a par with cadet entries, warrant officers were to be selected and a new rank introduced, which meant a further addition to age. The remark that the new officers would start "some years later" was a sop to opponents of the principle, as was the reference to promotion. The inference was that the new officers were not likely to be serious competitors with cadet entries for promotion to the higher ranks.

The details were promulgated five months later * and the following are the salient points:

Candidates to be selected from warrant officers and from petty officers passed in seamanship for warrant rank.

Selections to be made from candidates not over 25, but at first this age may have to be slightly exceeded.

A recommendation from the captain of a sea-going ship to be indispensable and form the chief element in the decision.

Petty officers on selection to be given acting warrant rank.

Selected candidates to undergo courses in gunnery and torpedo in the Excellent and the Vernon.

Successful candidates to be promoted to acting mate, and receive six months' instruction in navigation and allied subjects at the R.N. College, Greenwich.

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* A.W.O. 672 (C.W. 8538), August 9, 1912.

Mates to be wardroom officers and, in addition to pay of 8*s.* a day,* to receive a messing allowance of 2*s.*†

Acting mates to be confirmed on conclusion of courses and appointed to sea-going ships. The examination results and recommendations from sea to determine the period before promotion to lieutenant. The minimum to be two and the maximum about three years.

Outfit gratuities of £25, £50 and £50 to be granted on promotion to the three grades. (W.O., mate and lieutenant.)

Officers may specialise in exceptional cases.

To be on the same footing as other lieutenants in respect of promotion, pay, retirement and retired pay.

Despite its defects, had the selections been confined to *young* warrant and petty officers of 25 or *slightly* above, as stated in the regulations, the scheme would have produced the result intended, but the age factor became a problem from the outset. One reason was that before taking the seamanship examination for warrant rank a candidate " must have served seven years at sea."

Within a year of the first commissions being awarded, a committee was appointed, under Rear-Admiral A. L. Duff, " to . . . report on the system of advancement of naval ratings." ‡ The committee found that it was impossible to keep the age down to 25 and that in practice it approximated more nearly to 30. The report also stated that the normal system of advancement to petty officer could not be relied on to produce candidates of the right stamp and age for commissioned rank and that a rating likely to possess the qualities needed should be picked out as early as possible, before his ideas had become permanently associated with those of the lower deck.

The committee suggested, *inter alia :*

Selection, at 20, of leading seamen and able seamen passed for that rating.
To qualify for seaman gunner or torpedo man and pass the educational test.
Spend two years at sea as petty officer and pass for warrant rank.
Qualify for mate at 24.

These suggestions were not put into force, probably because within five months the War had broken out.

FIRST SELECTIONS OF MATES.

The first selection boards in home waters sat in August, 1912, and the successful candidates, " confined to unmarried men," § were announced on September 28. The number was eighteen and consisted of seven gunners, four acting gunners, one acting gunner (T), one acting boatswain and five petty officers. The senior of the batch was a gunner of nearly three years' seniority (November 25, 1909), aged 31. On the other hand there was a recently promoted gunner just under 26—he reached that age before being commissioned—who has since attained post-rank.

As an earnest of the Admiralty's good faith regarding further promotion, on the same date Lieutenant (ex-warrant officer) T. J. S.

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* The pay of a sub-lieutenant was 5*s.* a day.
† Supplementary officers also received this messing allowance.
‡ " First Lord's Statement explanatory of the Navy Estimates, 1914–15."
§ Hansard, April 17, 1913.

Lyne, then of ten years' seniority, was promoted to commander. He was the first ranker commander for eighty-four years.*

The first commissions as mates, numbering thirteen, were dated February 14, 1913, and on November 1 the first batch to complete courses were appointed to seagoing ships. By the end of the year a total of forty-four had been commissioned. In his speech on the Estimates for 1913, Mr. Churchill reviewed the progress of the mate scheme and remarked :

> "I have noticed a tendency in some foreign newspapers to speak slightingly of this development, as if it were a desperate expedient to which our shortage of officers compels us. I therefore wish to make it clear that we regard promotion from the lower deck, with possibilities of advancement . . . to the highest ranks, as a permanent and essential feature in our naval system."

A week previously the Secretary of State for War, Colonel Seely, (now Lord Mottistone), in his speech on the Army Estimates, remarking that General Robertson, the ex-private, was head of the Staff College, announced an improved system of ranker promotion. Candidates were to be selected after three years' service, "receive an outfit allowance of £150 instead of £100, as at present," and be given a Secretary of State scholarship of £50 a year for three years. They would then be exactly in the same position as any other officer and " the rank of second lieutenant will in consequence be abolished." The permanent additional charge to the Estimates would be between £100,000 and £150,000 a year. Expenses were to be kept down on the principle " that a man [officer ?] shall be able to live in your regiment, even though he be a poor man." . . . " We give up the vicious old system which was open only to men of wealth, and which built up a permanent wall against the advance of the private soldier to commissioned rank. We mean to break down that wall . . ., with the consent of all parties, . . . greatly increase the number . . . and have a continuous scheme."

ROYAL MARINES.

The second branch to be granted early promotion was the Royal Marines. On February 19, 1913, it was announced (A.W.O. 85, 1913) that two commissions annually would be awarded to selected warrant officers, N.C.Os. and men. The age limit was to be 25. Promoted to warrant rank, they would undergo courses similar to the mates, with an additional one at headquarters. On promotion to Lieutenant, R.M., they would come under all the regulations for the corps. The first selected were two corporals who were promoted to Acting R.M. Gunner on April 19, 1913.

Speaking on the Estimates for 1914, Mr. Churchill said :

> "The system of promotion from the lower deck is proceeding steadily . . . thirteen mates are now at sea, and we have had very satisfactory reports from the Fleet about

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* Promoted to captain on December 31, 1918, he was retired on reaching the age limit in August, 1925, was promoted rear-admiral on the retired list in April, 1931, and knighted in King George V's Birthday Honours, 1935, as Rear-Admiral Sir Thomas J. Spence Lyne, K.C.V.O., C.B. D.S.O., retired.

them. Thirty-one are going through courses . . ., twenty-two more are qualifying and thirty-five more will be qualified by March 31, 1915, or a total of 101 promotions . . . within the period of three years. That process will continue."

THE MATE (E) SCHEME.

He then referred to the extension of the mate system to the engineering branch :

> "We have instituted quite recently the rank of . . . mate (E). The first . . . ten have already been selected, and we are working . . . to have 50 mates . . . from the engine room . . . by March, 1918."

Mr. Hugh Edwards, Labour M.P., who had won the ballot for an amendment on the Estimates, moved that :

> "In the opinion of this House, the selection of officers for the Navy should be on a wider and more democratic basis, and that provision should be made for a more rapid promotion from the lower ratings to the executive [? commissioned] rank."

Mr. G. N. Barnes seconded the amendment, and Dr. Macnamara, Parliamentary Secretary to the Admiralty, "the son myself of a non-commissioned officer," in reply said "so far as the reports have come in, they [the mates] are doing admirably." In a detailed review of the progress to date he "fully described what we have already done" and remarked : "I do not suppose for a moment that this represents the last word upon this topic." The discussion occupied twenty-two columns of Hansard.

The details of the mate (E) scheme had been announced in the Press a month earlier,* and appeared in the new Volume 11 of K.R. and A.I., dated March 31. The number was fixed at fifty, spread over five years, and the age limit at 32, to be reduced to 30 in three years. Candidates were to appear before a squadron committee, those selected to take a qualifying examination afloat (educational and engineering) and a final selection made at the Admiralty. Those chosen were to be commissioned as acting mate (E) and undergo courses at the R.N. College, Greenwich, and the R.N. Engineering College, Devonport. This scheme differed from the executive and Royal Marine schemes inasmuch as the preliminary selection afloat was made before taking the first examinations and candidates finally selected were promoted direct to commissioned rank instead of the intermediate grade of warrant rank.

THE WAR PERIOD.

The position just prior to the outbreak of the War was that thirty-five mates had qualified and gone to sea, nine were completing their courses, and seventeen were at Greenwich College—total sixty-one. Twenty-two candidates were at Whale Island undergoing the technical courses as warrant officers. Four Royal Marine candidates had been promoted to warrant rank and the first two were completing their courses. In the engineering branch, although candidates had been selected, no commissions as mate (E) had been announced.

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* *Portsmouth Times*, February 13, 1914.

Courses for all officers lapsed when hostilities commenced, and, having been appointed to seagoing ships for the test mobilisation in July, warrant officer candidates who were satisfactorily reported on were commissioned as mates at various later dates. The two 1913 R.M. candidates were commissioned on August 5, 1914, and the two 1914 selections in December and January. The first commissions as mate (E) were dated November 1, 1914, the senior officer being an artificer engineer with over four years' service in warrant rank. The number was twelve and a further two were commissioned a month later. The first mates to become lieutenants were promoted on February 14, 1915.

The rapid War expansion of the Fleet with the increased demand for officers and the success of the mate system, in producing capable, if comparatively old, junior officers, caused the Admiralty to make further use of it and select much larger batches. In 1915, 108 candidates were promoted direct to mate in two batches of fifty-seven and fifty-one. Of the latter batch forty-seven were warrant officers and only four petty officers, including a petty officer telegraphist.

The result of this huge disproportion was further to increase the age problem, and that year, in an order instituting a confidential recommendation form, the Admiralty stated:

> "Attention is drawn to the desirability of selecting men for advancement to acting mate at as early an age as possible, and in future no candidates are to be considered . . . over the age of 32."

This was seven years over the 25 originally aimed for, and an age when cadet entries were lieutenant-commanders—two grades above the mates.

The suspension of the qualifying courses for lieutenant during hostilities meant that accelerated promotion would not be attainable until training was resumed after the War. Consequently, instead of promotion being possible from two years and onwards as mate, officers would have to serve the full three years, still further increasing the age on reaching the rank of lieutenant. To overcome partly this disability and reduce the period, the Admiralty decided that three months' service as warrant officer should count for one month's service as mate. Thus a mate who had served three years in warrant rank could gain twelve months and become a lieutenant in the minimum period of two years.

AUSTRALIAN NAVY SCHEME.

In 1915, the Australian naval authorities decided to institute mate and mate (E) schemes, and it is remarkable that, despite the Admiralty's three years' experience of the system, they limited the candidates to "warrant officers who have served at least three years in that rank." Furthermore, no mention was made of time spent in warrant rank counting in part as mate service for promotion to lieutenant. Rather naïvely the order continued:

> "At present, owing to the very few warrant officers serving in the Royal Australian Navy, one executive warrant officer and one artificer engineer will be selected in

alternate years, but in future, when the field of selection has become greater, the number of these promotions will be increased."

The scheme admitted of " selections being made from the rank of stoker warrant officers, as well as from artificer engineers, for the rank of engineer mate." The regulations were framed " after reviewing the present facilities in Australia for training officers " and stated :

> **" As soon as circumstances render it possible these regulations may be amended to include theoretical courses . . . on shore, and it is possible that, later on, the field may be widened by the selection of more junior ratings than warrant officers. . . .[*]**

In 1923 the scheme was extended to the accountant branch of the Australian Navy and two ratings were commissioned as mates (A) who are now paymaster lieutenant-commanders. Another mate (A) was promoted in 1927, but he has since retired, and in 1937 a rating was commissioned as paymaster sub-lieutenant.

COMMUNICATION BRANCHES.

Warrant and petty officers of the signal and wireless telegraphy branches were eligible for mate if they passed the seamanship examination, and some were commissioned as executive officers. In 1916, owing partly to an increased demand for commissioned signal and wireless telegraphy officers, and partly to a legitimate desire among the warrant and petty officers of these branches for an avenue to commissioned rank in which their specialist knowledge would continue to be used, the Admiralty decided to extend the system to the communication branches.

On September 16, 1916, four candidates from the signal and three from the wireless telegraphy branches were commissioned and were later shown in the seniority list of the Navy List as (S) and W/T respectively. Others were similarly promoted among batches of executive mates, and in May, 1918, four from the wireless telegraphy branch were commissioned separately. These officers were not eligible for promotion above the rank of lieutenant-commander, unless they qualified and transferred to the executive branch. After the War the signal officers were given the prefix V/S in the seniority list, instead of (S).[†]

The commissions awarded under the mate and similar schemes up to the end of the War are given in the table on next page.

During the War lieutenants (ex-mate) were much sought after as executive officers of small craft, and several who had qualified for gunner or gunner (T) or as higher gunnery and torpedo ratings were employed " in lieu of specialists." Towards the end of the War several were in command of small craft, though the senior ones did not reach four years' seniority until 1919. Some of these officers were awarded accelerated promotion to lieutenant for meritorious War service. The first aircraft ever used in a Fleet action, from

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[*] Australian Navy Order 30, June 12, 1915.

[†] This extension of the mate system to the signal and wireless telegraphy branches was a War-time measure only ; no more such promotions were made after the War.

	Mates.			Mates (E).	Royal Marines.	Total.
	Executive.	(S).	W/T.			
1913	44	—	—	—	—	44
1914	31	—	—	14	3	48
1915	108	—	—	28	3	139
1916	45	4	3	43	1	96
1917	89	1	3	52	3	148
1918*	39	—	4	24	2	69
	356	5	10			
TOTALS	371			161	12	544

H.M.S. Engadine at Jutland, and from which a valuable report was sent, was piloted by one of the first mate candidates who had been selected when a petty officer.†

POST-WAR PROMOTIONS.

With the end of hostilities the pre-War procedure was resumed. In February, 1919, ten artificers were commissioned as mates (E) and in April two R.M. candidates were promoted to Royal Marine gunner and shown in the Navy List as " Corps Commissions," but no executive selections were made that year. The first post-War executive selections were made in January, 1920, and numbered six. They included one gunner, four seaman petty officers, and one petty officer telegraphist, the petty officers being promoted to warrant rank. Unfortunately the age limit was not adhered to, the gunner being 27½. Technical courses were taken at Chatham, instead of Portsmouth, and five officers were commissioned in September. The ex-telegraphist failed and was discharged to the shore and another officer was not recommended for lieutenant and was retired, four only becoming lieutenants.

The second batch, of six candidates, was promoted to warrant rank in August, 1920, but while undergoing courses it was decided that candidates should be promoted direct to mate. They were, therefore, commissioned to date December 1 and so gained four months' seniority. The 1920 numbers for the other branches were engineering six and Marines two.

During 1920 the age problem of the pre-War and War mates cropped up in a new form, that of pay. After questions and correspondence from M.Ps., Press discussion, and Service inquiries, it was announced in the House on December 16 that officers commissioned before January 1, 1920, would be paid at a special rate

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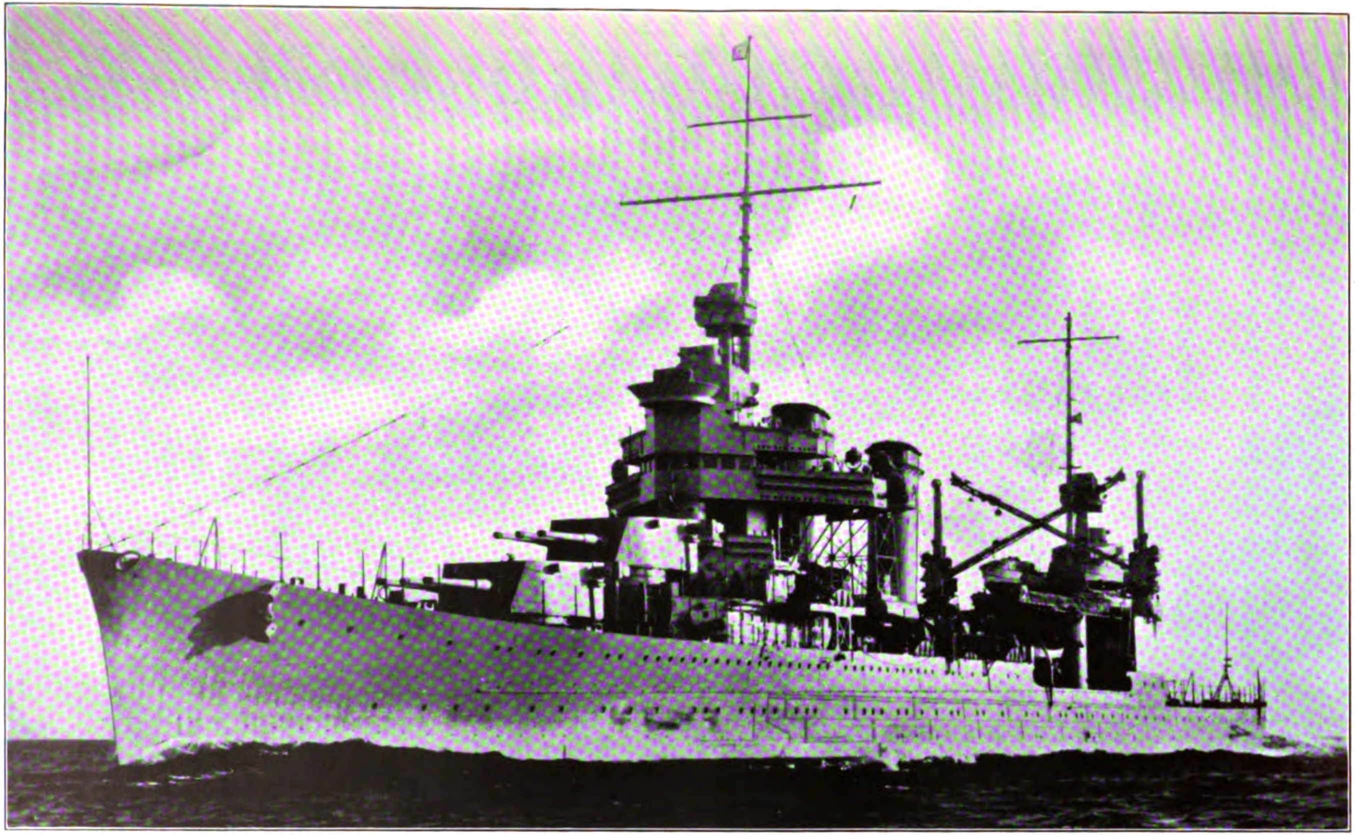
* The second half-yearly promotions were not made in 1918 owing to the signing of the Armistice in November.

† Flight Lieutenant F. J. Rutland, R.N. He was awarded the D.S.C. and also the Albert Medal for life-saving on the same day. As a Flight Commander at the end of 1916 he recommended, as the result of experiments, the adoption of aeroplanes instead of seaplanes for flying off ships, which virtually initiated modern aircraft-carrier developments. Later he transferred to the Royal Air Force and became a squadron leader, in which rank he retired in 1923.



THE UNITED STATES CRUISER VINCENNES.

Completed 1937.

(*Official U.S. Navy Photographs, by courtesy of Navy Department.*)

which resulted in the following increases: mates, 1*s.*; lieutenants, on promotion, 3*s.*; after four years, 2*s.* and after six years, 1*s.* No permanent liability was added to the Estimates, as the concession was to cease when the last War mate became a lieutenant-commander.

POST-WAR RETRENCHMENT.

The inevitable reduction in the post-War Fleet affected all classes of officers, but some more than others. Among the mates the proportion was high. Several had left the Service during earlier reductions, but under the Geddes "axe" scheme of May, 1922, 139 lieutenants (ex-mate), between the ages of 30 to 39, were retired. As there was practically no surplus in the engineering branch the engineer lieutenants (ex-mates E) were not affected.

REVISED MATE SCHEME.

In 1920 the Explanatory Statement of the Estimates included ninety paragraphs on "Naval Policy," of which eight discussed an improved system of "Promotion from the Lower Deck." It was remarked that, although a rating could take the special-entry cadet examination, owing to "the lack of early educational facilities" and "the specialised training received since joining the Naval Service . . . only a small percentage . . . could possibly take advantage of the . . . system."

In discussing the mate scheme, the Statement observed: "Many desirable officers have been produced" but failure was admitted because "owing to the . . . seven years' service rule, the majority . . . do not reach the rank of lieutenant until 28–29 . . . or even later," whereas a cadet entry did so at about 22. It was also admitted that "there is little chance of a . . . mate reaching a higher rank than lieutenant-commander."

The new scheme was "to remedy this." A man of 21 who had passed a sea selection board and the seamanship examination and taken a first-class educational certificate would be eligible for selection before an Admiralty board.

> "Provided a man takes a first-class certificate in the further special courses . . . he can become a lieutenant at . . . 23 . . . at about the same age as a special-entry cadet. . . . He would then be on a precisely similar footing to other lieutenants with regard to promotion."

Future officers were to go through a special morale course "designed to inculcate . . . knowledge of discipline, maintenance of morale, and capacity for command of men," which had not hitherto been given in the Navy. It was a course successfully practised in the Army and produced 95 per cent. of its officers during the last months of the War.

> "An analogous system was to be applied to the engineering branch" the Statement continued, ". . . it would ensure to all the opportunity, which is their right, of reaching a high rank in His Majesty's Service. . . . It is hoped . . . to make further proposals with the object of broadening the field of entry and of removing the restrictions which financial contributions impose upon the promising lad who may display the qualities necessary in an efficient naval officer."

The First Lord, Mr. Walter Long, speaking on the Estimates, emphasised the foregoing statement :

> "The advantages . . . to cadets should be also given to boys . . . from elementary schools. . . . We have made . . . a tremendous stride in the direction of opening the quarter deck. . . . It is a real alteration, and it will be true . . . that a man can go to sea with the assurance that . . . he may rise to flag rank, which under existing conditions is impossible."

Later, in replying to the debate, the First Lord again stressed the point :

> "We are really approaching this question . . . with a steadfast determination to remove any obstacle likely to prevent the boys having this fair opportunity."

The Press seized on this explicit promise of new opportunities, and several papers published articles, as in 1912, with headlines such as "From Bluejacket to Admiral." *

ARTIFICER TO MIDSHIPMAN (E).

In Lord Lee's "Explanatory Statement" of the 1921 Estimates it was announced that promising lads in the boy artificers' training establishment, who had specially distinguished themselves, would be sent to the R.N. Engineering College. They would work side by side with the early-entry Dartmouth College cadets to be trained as midshipman (E). Later, if selected, they would take the advanced courses and it would "be possible . . . on their merits to reach the highest ranks."

The number was limited to two a year, one from each half-yearly entry. The first candidate was selected in January, 1924, and a second in September, but in only three other years (1925, 1928 and 1936) has the number been two. One only was promoted in each of seven years and none in two years, giving a total of 15 in 13 years. Since 1935 the promotion has been to cadet (E) instead of midshipman (E).

In February, 1937, the First Lord said that the possibility of increasing the number of cadets (E) from artificer apprentices was under consideration, and that he would like to see more. Three were promoted during the year for the first time.

The senior of these officers reached the rank of lieutenant-commander (E) in September, 1936, and the next two in 1937. One of them won the Newman Memorial prize for first place in the practical engineering examination and qualified in the advanced engineering course, and one other has taken this course.

In the executive branch no such promotion scheme exists. As mentioned previously, ratings are eligible for the special-entry cadet examination and twenty-one lower-deck candidates appeared before the interview committees between 1913 and 1919,† but only one was selected. He retired in 1935 as a lieutenant-commander.

* *Army and Navy Gazette*, April 17, 1920.

† Hansard, May 7, 1919.

WORKING OF REVISED MATE SYSTEM.

The first promotions to mate under the revised system were made in 1921, but numbered four only, as compared with seven mates (E). In 1923, to give fuller opportunity for promotion at an early age, the Admiralty removed the restriction that candidates must have obtained a leading rate. The next year the selections included an able seaman, the others being four leading seamen and a leading telegraphist, total six.

By 1926, after five years of the new procedure, it was evident that the desired result had not been achieved. Twenty-seven mates only had been promoted as compared with twenty-eight mates (E), although there were nearly ten times as many seamen as artificers and mechanicians. In the Royal Marines the number had dropped to one in 1924 and nil for two years.

The first of the pre-War mates entered the zone for promotion to commander in February, 1926, and questions commenced from all sides of the House of Commons and in the Press, on promotion to mate, age, results of courses, specialisation, employment and promotion to commander.

In April the Admiralty issued a letter to flag officers, stating that the general question of promotion and employment of officers promoted from mate had been under consideration. Attention was drawn to the fact that the original regulations provided that lieutenants (ex-mate) " might in exceptional cases, be selected to specialise " but very few had applied and " the number . . . selected was almost negligible." A hope was expressed " that more . . . would apply " and the request made " to impress upon commanding officers the desirability of giving every encouragement to suitable candidates," . . . " removing any impression . . . that these officers, even if suitable, would not be selected . . . so long as other candidates were forthcoming."

Promotion of lieutenant-commanders (ex-mate) would also come under consideration shortly, the letter stated, and, in accordance with the mate scheme regulations, " these officers should . . . be considered on their merits . . . with other lieutenant-commanders of similar seniority, but . . . any . . . of exceptional merit were to be recommended, although . . . below the zone, . . . in exactly the same way as younger lieutenant-commanders " and " this fact was to be specially borne in mind when recommendations . . . were being made." *

The next day a similar announcement as regards eligibility to specialise was made in Fleet Orders. The restricting clause " in exceptional cases " was omitted and the statement made that lieutenants (ex-mate) were " eligible to specialise under the same conditions as other lieutenants " and that applications would " be given every consideration." †

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* C.W. 3761, April 15, 1926 : " Promotion of Mates."

† A.F.O. 1096, 1926.

SPECIALISATION.

Up to the issue of the Fleet Order, only one ex-mate had specialised in navigation, and three in physical and recreational training. Even by 1930 there had been no (G), (T) or A/S specialists, and only one had taken the staff course. Of the post-War officers, four years after the Fleet Order, only one had qualified in (G), one in (T), one in surveying, two as pilots and two as observers.

THE FIRST COMMANDER.

Few of the senior officers in 1926 were in first-class ships from which promotions are usually made, but a lieutenant-commander in command of a minesweeper was relieved before completing the usual term, appointed to a battle-cruiser refitting and promoted to commander at the end of the year. The first promotions of ex-mates (E) to engineer commander occurred in June, 1927, and numbered three.

Nevertheless, the Parliamentary and Press campaign continued, finally crystallising into a demand for a committee to review completely the whole system, which the Admiralty admitted was not producing enough candidates of the right type at the right age. Among the reforms advocated were preliminary educational and technical training before being commissioned, the abolition of the separate rank and distinctive title of mate, and the promotion of candidates to sub-lieutenant, to undergo the same courses and receive the same accelerated promotion as cadet entries.

In response to the demand for a committee of inquiry on March 17, 1930, Mr. A. V. Alexander, in introducing the Navy Estimates said : " I have had inquiries made into the general question. . . . I also intend to extend the inquiry to cover the whole question of the entry of . . . officers." Speeches by Captain W. G. Hall (Portsmouth Central), Mr. Hore-Belisha (Devonport), and other members drew a further statement from the First Lord that he was " not at all satisfied that the mate scheme . . . is producing enough applicants for promotion." He continued :

> " We are now bringing in a new system of national education, under which we hope . . . there will be a free educational road . . . from elementary . . . to secondary school . . . and . . . to university ; and, whatever branch of the public service is available, I want those who go through the national system . . . to have an equal opportunity of entering that Service. I believe that my inquiries will show that there is room for extending the special-entry system, and for its including a larger number . . . of the secondary school type . . . and that we shall really democratise, if I may use the term, the officer ranks. . . ."

Seven months later he informed the House that two committees had been set up, the one to " review the working of the system by which warrant officers, petty officers and ratings may qualify for promotion to . . . lieutenant and above through the rank of mate," * and the other " to consider whether the present systems of entry of

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* The members of the mates' committee were : Vice-Admiral F. Larken (Chairman), Sir Charles Walker, Deputy-Secretary of the Admiralty, Engineer Rear-Admiral H. L. Parry, Captain A. T. B. Curteis, and Commander J. Figgins, the senior ex-mate. —A.F.O. 2837, 1930.

. . . cadets and cadets (E) are such as to give candidates of the requisite standard from all types of schools and belonging to all classes of the community, a fair opportunity of being considered on their merits for entry as cadets." *

THE 1931 SYSTEM.

On May 20, 1931, Mr. Alexander announced in the House that the Admiralty had decided to institute a new system. The title of mate would be abolished and that of sub-lieutenant adopted. To overcome the high age and disparity in qualifications, "a system of intense tuition, both in educational and professional subjects," would enable "a candidate to reach commissioned rank in the executive branch at about 21, and about 22 for engine-room artificers, and rather over 25 for stokers." Instead of spending only three months at Greenwich College, as compared with the six of sub-lieutenants, ex-lower-deck officers would be given three months' preliminary tuition and then take the full course of six months. From the beginning of the six months' course they would join up with cadet-entry officers and undergo similar courses with them.

The main points of the scheme as given in Fleet Orders were as follows:

> Likely boys were to be drafted to capital ships and cruisers only, able seaman rating was to be possible after twelve months as ordinary seaman, instead of fifteen, and every encouragement given to pass for leading seaman at 19½. When rated acting leading seaman they were to be sent to another ship. After not less than six months as such, and at a minimum age of 20½ and a maximum of 24, a candidate, if recommended and passed professionally and educationally, to be eligible to appear before a Fleet Selection Board. Those recommended to be rated acting petty officer and undergo a morale course at Portsmouth Barracks and then appear before a Final Selection Board. Those selected to be appointed acting sub-lieutenants, the minimum age being 21. Ratings who were married were ineligible.†

END OF THE MATE SYSTEM.

In December, 1931, twelve able seamen, twice the average number for the preceding twelve years, were commissioned as mates and the number of mates (E) was four. One R.M. commission was awarded after none for two years, but as the next two years were also blank the number remained at one only for five years. In 1932 the mates fell to eight, the mates (E) remaining at four. These were the last promotions under the mate system, the totals for which were:

	Mates.	Mates (E).	R.M.	Total.
Pre-War and War	371	161	12	544
(5 to 7 years' average) . .	(53)	(32)	(2)	
Post-War	92	75	13	180
(14 years' average) . . .	(7)	(5)	(1)	
Totals	463	236	25	724

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* The members of the cadets' committee were: Sir Ernest Bennett, M.P. (Chairman), Admiral of the Fleet Sir Osmond de B. Brock, Rear-Admiral the Hon. R. A. R. Plunkett-Ernle-Erle-Drax, Sir Edmund Phipps, late Deputy-Secretary of the Board of Education, and Mr. F. R. Dale, Headmaster of the City of London School.

† A.F.Os. 2473, October 16, 1931, and 2945, December 23, 1932.

WORKING OF REVISED SYSTEM.

The new sub-lieutenant scheme came into full operation in 1933 when seventeen executive and fifteen engineering candidates were interviewed by the Fleet Selection Boards, twelve and nine respectively being selected, but the numbers finally commissioned were only six sub-lieutenants and four sub-lieutenants (E)—one-third of the original number of candidates.

The results of the first final educational examination at Greenwich College did "the lower-deck candidates great credit." * Out of sixty-one sub-lieutenants the six from the lower deck obtained the second, 19th, 21st, 28th, 34th and 38th places. One obtained a first-class and the other five second-class certificates.

In the technical courses another achieved distinction by winning the Goodenough Memorial Prize for the highest marks obtained in gunnery by a sub-lieutenant during the year. But none was successful in gaining the "five firsts" necessary to obtain the maximum accelerated promotion. One with four "firsts" and a "third" happened to be also the youngest and, having been commissioned at 21½, was promoted to lieutenant before 23. The others reached lieutenant's rank at ages between 23 and 27, as compared with cadet-entry ages of 21½ to 24½.

The numbers commissioned in the first four years were :

	Sub-Lieut.	Sub-Lieut. (E).	R.M.	Total.
1933	6	4	—	10
1934	5	4	1	10
1935	3	3	1	7
1936	4	4	1	9
Totals.	18	15	3	36

FURTHER MODIFICATIONS.

On the assembly of Parliament in January, 1937, questions were being put to the First Lord of the Admiralty inquiring why, with the vast expansion of the Navy and the large increase in cadet and other officer entries, lower-deck promotions were at their lowest for twenty-five years. Answers showed that there was no actual lack of candidates, as ninety-nine seaman ratings were recommended on the special confidential form and seventy-eight had passed the higher educational test, though only fifteen were fully qualified.

In reply to the Estimates' debate, the Civil Lord (Mr. Lindsay) said :

> "If hon. members are dissatisfied with the numbers, so are we, and that is why we are trying to change it. . . . We can make the ladder from the lower deck easier to climb. We can do it by giving greater encouragement and greater training facilities to the exceptional boy."

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* *The Times*, August 11, 1934.

Early in the year the Admiralty had made inquiries as to why so few candidates were finally selected and stated that more were desired. The results were seen in the July promotions to sub-lieutenant (E) which numbered eight—twice as many as in 1936. In September twelve sub-lieutenants were promoted, three times the figure of the previous year, and later another was added, making the highest number in the nineteen years since the War. The number in the Royal Marines remained at two, although the Parliamentary Secretary had stated in February that " consideration will be given to the removal of the present limitation if more than two suitable candidates are forthcoming this year."

The inquiries as to why so few candidates were negotiating the several stages to a commission at an early age drew attention to the fact that it was too much to expect that " to a considerable extent the rating must prepare for the examination in his own time," as stated in the 1931 regulations, and to the many inherent difficulties of training individual officers in separate ships. Furthermore, the change to another ship on being rated acting leading seaman meant getting a new recommendation and probably caused the loss of a year.

On September 2 the Admiralty announced further changes * for the executive branch, having " decided that greater facilities should be afforded outstanding ratings to enable them to attain the necessary professional and educational standards." Under the present arrangements ratings are to appear before Fleet Selection Boards at an earlier age and without passing the educational and professional qualifications as hitherto. The new requirements are: a recommendation, passed Educational Test, Part II, passed for leading seaman, and be over 20 and under 24 on following January 1. Fleet Selection Boards are to sit in the autumn, selected candidates to be rated acting leading seaman, sent to one ship (usually a boys' training ship) and given courses of 8 to 9 months' in seamanship, educational subjects, and command under the instruction of officers. In July candidates to be examined in seamanship and educational subjects and then appear before the Final Selection Board as formerly. The number selected for the 1937–8 course was thirty-one.

PROMOTION TO THE HIGHER RANKS.

The criterion of success lies not only in the numbers commissioned but also promoted to the higher ranks. This has always been held out as an integral part of the system, as well as a legitimate aspiration, by the First Lords of the three parties in the House of Commons and in published Admiralty regulations and statements of policy.

Ex-mates first entered the zone for commander in June, 1926, the number being nine. By December this had increased to twenty-four and the first commander was promoted at the age of 40. This was the first regular promotion of a lower-deck entry to commander for

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* A.F.O. 1864, 1937.

almost a hundred years, and it marked the beginning of a new epoch, though two years elapsed before the next selection was made. During the following five years, when the number in the zone reached forty-two, one ex-mate was included in each of the ten successive half-yearly lists, up to June, 1933. The next one was not selected until a year later. He proved to be the last of those promoted from 356 pre-Armistice mates.

No further promotion occurred for two years until June, 1936, when the first commander from the post-War mates was selected. In 1937 one was promoted in the June and another in the December lists, giving three from post-War officers and a total to date of fifteen commanders.

The first commander (ex-mate) entered the zone for captain in December, 1930, but did not attain post-rank until three years later. Another was promoted in June, 1935, and a third in June last. The ages of these captains on promotion were 47, 44, and 42 respectively —the last having been commissioned in 1917 before he was 23. Although the first has no chance of attaining flag rank, the second may and the third is likely to reach the top of the captains' list before compulsory retirement at 55.

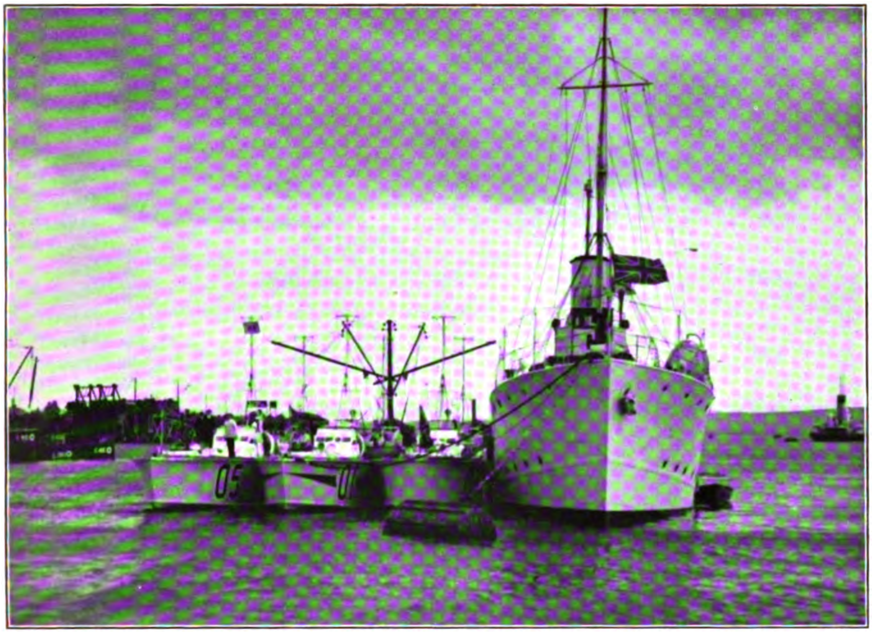
The ex-mates (E) have fared better than the ex-mates at the commander stage, not only in actual promotions but also in proportion to their numbers. This is due partly to the non-occurrence of large-scale premature retirements in the engineering branch, such as occurred in the executive, but chiefly to the temporary shortage of cadet-entry engineer officers resulting from the Selborne-Fisher common-entry scheme of 1903.

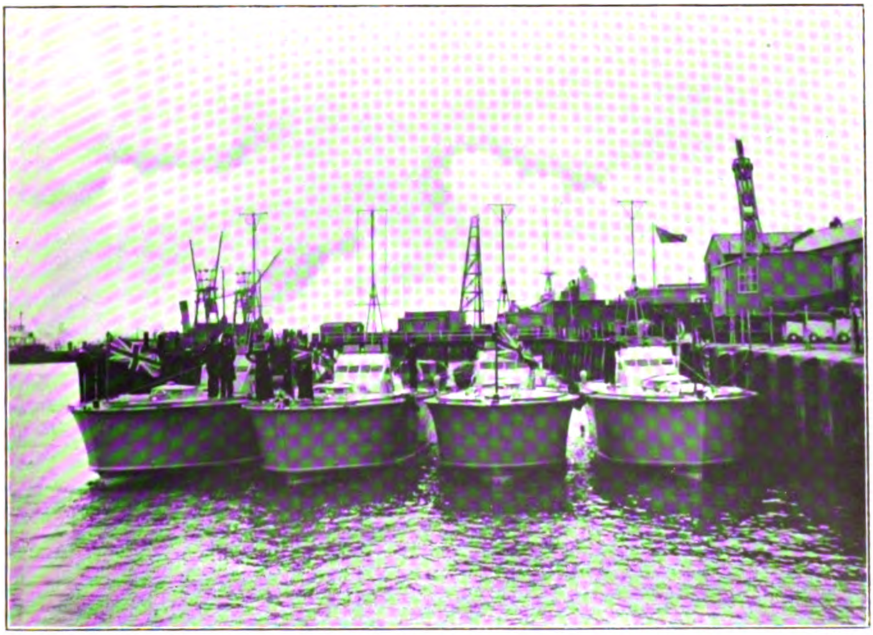
The first ex-mates (E) entered the zone for engineer commander n June, 1927, their number being six, but the first selections were not made until December, when this figure had risen to nineteen, and three were promoted. During the ensuing ten years such promotions have been a regular feature of each half-yearly list, on six occasions equalling the ex-cadet selections and once exceeding them by one. This was in June, 1933, when the number was five and included the first post-War ex-mate (E) to reach commander's rank. In 1937 the number fell to two in June and one in December. Fifty-one of the 161 mates (E) commissioned during the War and twenty-one of the post-War officers have been promoted, giving a total of seventy-two engineer commanders from the lower deck.

The higher age of the ex-mates (E), as compared with the ex-mates and still further with cadet-entry engineer officers, although not an undue handicap at the commander stage, became one at the captain stage. Here the lower limit of the zone is eight years' seniority, which is four higher than that for executive officers. The first three engineer commanders did not enter the zone, through age retirement or death, and consequently the first to do so were two of the second batch, in June, 1936.

In the Royal Marines only two of the twelve War commissions and one of the post-War officers have been promoted to major, giving a total of three.

The numbers on the active list at the end of 1937 were:





BRITISH MOTOR TORPEDO BOATS OF THE 1ST M.T.B. FLOTILLA.

Joined Mediterranean Fleet, 1937.

(*By courtesy of the builders, The British Power Boat Co., Ltd., Hythe, Southampton.*)

Rank.	Executive.	Engineering.	R.M.	Total.
Captain	3	—	—	3
Commander	12	64	3 (majors)	79
Lieut.-Cdr.	32	22	10 (captains)	64
Lieutenant	52	31	3	86
Sub-Lieut.	19	13	3	35
Totals	118	130	19	267
Total numbers commissioned 1913–1937	494	259	30	783

That the principle of promotion from the lower deck is generally accepted there is now no question. The problem is how best to apply this principle. Each scheme has been an improvement on the previous one but it has yet to be seen whether the latest arrangements now in force will meet all the objections to the earlier schemes which experience of their working revealed.

"HISTORICUS."

CHAPTER VII.

NAVAL SIGNALLING.

HISTORICAL.

The earliest known complete code of Naval Signals is that drawn up by the Emperor Leo in the ninth century A.D. Having laid down some of the signals to be used, and indicated the need for a good look-out, he points out that " in emergency you will not be able to make use of either the voice or of the trumpet to communicate what is necessary, because of the uproar and the tumult, the sound of the sea, and the crash of ship against ship, the noise of the oars and above all the clamour of the combatants." He concludes with the advice " And thus, O General, let the exercise of these signals be practised so that all officers in command of ships under you may have certain knowledge of all such signs, of the reason why each is made and when and how may not fail so that, well familiarised with the signals, they may readily understand them in time of emergency, and carry out the orders indicated " ; a most masterly summary of the essential requirements, evidently based on practical knowledge, and which might well have been written by an Admiral of the present day.

For a long time no advance was made, for the fact of the matter was that the art of tactics at sea was so rudimentary that practically no signalling was required. It was only as tactics developed that signalling advanced also. Thus the Mediterranean powers, who developed the tactics of the galley to a high pitch, also developed signalling, whereas the northern powers at the same period were behind alike in tactics and signalling. In the Black Book of the Admiralty, dated 1338, only two signals are mentioned ; one for calling a council and the other on sighting the enemy. When any ship sighted the enemy, unless action had previously been decided upon, all ships would gather round the Admiral and the senior officers would personally consult what to do.

As time went on the Mediterranean systems of signals became more complete, but even up to the days of the Commonwealth, the English instructions were rudimentary. In 1530 there were still only the signals for a council, for anchoring or " disanchoring," the Admiral's stern lights for use at night, a distress signal, one for sighting the enemy and orders for flying flags in action.

Shortly afterwards a signal for altering course at night was introduced, when the Admiral would bear a light in his cresset for the space of one hour ; also the first recognition signal whereby a ship sighting a stranger " should strike his foresail and yaw " (that is, make a temporary swing from his course). Signals for fog were also laid down. Signalling by sails was frequently used in these days, the instructions being laid down by the admirals for their own fleets.

The ships that fought the Spanish Armada had similar and no more complete instructions.

FLAG SIGNALS.

The first true signal code appeared in 1653, and in it five distinctive flags were used; a weft of the ensign or jack (that is an ensign or jack tied in the middle), a pendant and three flags, red, white, and blue. The signal code expanded as time went on, the code of 1673 using fifteen flags. Four more were added in 1691. By 1782 about fifty different flags seem to have been in use and various signal books had been produced privately or by Admirals in command of fleets. Sailing and fighting instructions were issued by the Admiralty, and as a rule Admirals produced their own codes of signals.

Up to this time the meaning of the signal was denoted by the particular flag used, and the position in which it was flown. Thus, a certain flag at the mainmast head would mean one thing and at the foremast head, or at the gaff, would have a totally different meaning. The fifty flags hoisted in seven different positions could thus convey 350 different meanings.

More meanings were required but the limit had been reached. More flags could not be introduced because there are only a few colours which can be readily distinguished. These are red, blue, yellow, black, and white, and these cannot be mixed indiscriminately. For clarity at a distance flags should be either red and white, yellow and blue, blue and white, or black and white, besides the plain red, white, and blue flags. In order to convey more meanings the officers of that time were compelled to devise some other systems. Two were introduced; in both the meanings of the signals were numbered, and the number signalled by flags.

The first assigned one flag to each of the numbers 1 to 9 and 0, and by combining the flags, any desired number out of a code book could be signalled. The other method may be described as a chequer board or tabular method. Three or more flags could be used, one to each horizontal and vertical column of the table. Each square of the table had its number which could be signalled by hoisting the two flags denoting the horizontal and vertical columns. Thus a table of three columns could indicate any number from 1 to 9 and only three different flags would be required, though each number required a two flag hoist. As many as sixteen columns were used in some tables.

The numerical method was used by Kempenfelt in his signal book of 1782, and later Lord Howe collaborated with him to produce a signal book which was widely used in the Channel Fleet. Development at sea continued, and though the numerary and tabular systems persisted side by side for some time, the system of numeral flags was finally adopted. By 1790 the numerary system was well established with ten numeral flags and special flags for substitute, preparative, assent and dissent.

This development of the signal book had immediate effects on the tactical handling of fleets. The inflexibility of the old system led to Rodney's failure in spite of his tactical skill, whereas Kempenfelt and Howe were handling their commands with noteworthy success. Howe's feat of relieving Gibraltar in the face of the Spanish fleet has been attributed to his skill in handling his fleet with the aid of the new signal books.

But development did not cease, and in 1798 the Admiralty decided to issue signal books on the new plan, with the result that Gambier's code of 1799 was produced and issued. It was under this code that Trafalgar was fought.

The development of the tactical codes was, however, not all. The best of them could only signal a number of set sentences, e.g. " The ships chased have separated on different courses," or " Engage the enemy more closely." These signal books sufficed for action purposes, but greater flexibility was obviously needed for ordinary communication. Thus, about 1800 the first vocabulary, or marine dictionary, was produced privately by Captain Sir Home Popham. The first part contained nearly 1,000 words and another 1,000 was added in 1803 in a second part. The fact that the signal was taken from the vocabulary was indicated by using a special flag, the telegraph flag, superior to the vocabulary hoists. It was in this vocabulary code that Nelson's famous signal was made at Trafalgar. It was not hoisted all at once, as is done in the Victory on Trafalgar Day, but hoist by hoist on one pair of halliards.

At that time, as now, the value of secrecy was recognised, and when the code became compromised, the book itself was not altered, but the meanings of the flags themselves were interchanged, so that the enemy might not know the meanings of our signals. The meanings of the flags which first came into use in 1790 were thus changed in 1799 and 1803.

The vocabulary was added to as time went on and, finally, about 6,000 primitive words and 6,000 sentences, besides other tables, were included. To signal this large number with not more than three hoists necessitated more flags, and flags lettered from A to O were introduced.

In 1816 the vocabulary was again revised and issued to the fleet by the Admiralty. Matters remained in this state until 1889 when the signal books were revised ; the alphabetical series was completed, and a complete set of numbered pendants introduced. The code and books remain the same in principle to this day, and some of our flags still have the same colours and meanings as in the original code of 1790.

NIGHT SIGNALLING.

All this development of day signalling did little to help night signalling, and up to 1867 signalling at night had to be confined to the few meanings which could be conveyed by firing guns, or by displaying varying numbers of white or coloured lanterns. In 1858 Admiral Colomb, then a young officer, originated the idea of flashing a light by the Morse code. The idea was turned down at its first trial, but finally adopted in 1867. By this relatively simple means the whole of the signal books could be used as freely by night as by day.

In the early days of flashing, the messages could be transmitted by a mechanical sender rather like a musical box. By setting the instrument, any desired combination of four figures would be transmitted by flashing lantern so long as the handle of the instrument continued to be turned.

The use of flashing has grown steadily ever since. Day signalling by flashing a searchlight is widely used, and the same Morse code is of course used for wireless.

SEMAPHORE—THE "TELEGRAPH."

Though not used much for action signalling, the old telegraph or, as it is now called, the semaphore, played its part in naval signalling, particularly ashore.

The origins of the semaphore lie in the mists of antiquity. We read of the ancients conveying information by all kinds of shapes and devices, by the movement of windmill sails and the like. The first practical semaphore came into use, however, in France in about the year 1793, when the system devised by M. Chappe was widely used. The line from Paris to Lille was first authorised in that year, and was later extended to Dunkerque and to Brussels; other lines were built to Brest, Lyon, Strasbourg, and Basle. A message of 57 words reporting the result of a battle was passed the entire length of the line from Basle to Paris in three hours, no mean feat.

Chappe's semaphore consisted of a movable cross beam with movable arms at the ends of the beam, the various letters and numbers being indicated by varying the positions of the cross beam and the end arms. Telegraphs on this principle were installed shortly afterwards in Sweden, Germany, Denmark, Belgium, and Russia. The latter ran from the Prussian frontier via Warsaw to St. Petersburg, and thence to Moscow. One line alone had 220 stations.

The success of Chappe spurred people in this country to similar efforts, and two systems were produced. Both of these used large frames with hinged shutters which could be opened or closed at will. The one adopted by the Admiralty was devised by Lord George Murray and had six shutters. It was so promising that in September, 1795, a Mr. Roebuck was engaged to erect fifteen stations between London and Deal with a branch to Sheerness. By January, 1796, this line was complete, and the line to Portsmouth was taken in hand. This appears to have been complete by the end of the year. It is clear that Mr. Roebuck was a rapid worker, and must have had a free hand in the acquisition of the sites and the erection of the various buildings.

The creation of a telegraph line to Yarmouth was next considered, but not carried on, owing to the conclusion of peace, but on war breaking out again, Mr. Roebuck was instructed in October, 1805, to survey the line to Plymouth. He selected twenty-two stations and by July, 1806, all was complete. Another example of quick work. He reported that " at the Admiralty telegraph a reply from Plymouth began to be spelt out only twenty minutes from the time the same telegraph made 'message ended'." The Yarmouth line was again considered in 1807, and a line through St. Albans and passing near Cambridge was complete in 1808, using eighteen stations.

Up to 1815 the original shutter telegraph continued in use, but in that year the semaphore of two arms on a single post, much as we know it to-day, was suggested by Admiral Sir Home Popham. An experimental line to Chatham was set up and found to surpass the shutter type in quickness and clearness, and the work of converting and resiting the old lines was put in hand gradually. Progress was slow, however, in the period of peace after the Napoleonic wars, and the advent of the Wheatstone electric telegraph in 1838 made it only a question of time before the abolition of the visual telegraph. All stations were finally closed in 1847, and in April, 1849, the electric telegraph along the Fareham branch railway reached Portsmouth, once more connecting the Port Admiral with London.

SEMAPHORE AFLOAT.

During the time that the development of the shore telegraph systems was going on, many proposals were made for semaphore methods suitable for a ship or a boat or in the field. All these systems were based originally on a man, or men, holding their arms in various positions with various objects in their hands, such as a hat, handkerchief, disc or shape, sword, flag or oars.

They could all be classified under two headings; they were numerary or alphabetical. The numerary method, like the numerary flags, could only convey numbers and the meaning of the signal had to be looked up in a code book, vocabulary or dictionary. By the alphabetical system, on the other hand, any desired message could be spelt out letter by letter. The controversy between the partisans of the two systems was long and bitter, but the alphabetical system won.

Eventually the semaphores of Popham's system were supplied to ships in about 1816, and the system was in its turn superseded by Pasley's system in 1827. Its use then spread slowly and spasmodically throughout the Navy. It was undoubtedly the forerunner of the system we now use, since it used only the single post with two arms which could signal all the letters and numbers. This system is of course still used for short distance communication, and up to the time wireless was introduced, all ships carried large semaphores at their mastheads for long distance communication.

PERSONNEL.

The initial reluctance to adopt the flashing system may have been due to the fact that the transmission and reception of flashing signals require a body of specially trained signalmen, which did not then exist in the Navy.

Hitherto signalling had been superintended by the ship's officers assisted by able seamen. Admiral Vernon in 1740 ordered that "during the time of engagement every ship is to appoint a proper person to keep an eye on the Admiral and observe signals." We read in history of Mr. So-and-So, 5th Lieutenant of H.M.S. Nonsuch, having been detailed as signal officer. McArthur, at one time Admiral Hood's secretary, wrote that "it was the duty of clerks and Admirals' secretaries to watch signals." It was not until 1816 that the rating of Yeoman of the Signals was first introduced in the Fleet, ranking with Captains of the Mast, sailmaker's mate, etc., for purposes of pay, and later on as 2nd class petty officers. The increasing importance of the work is reflected by the fact that in 1862, Yeomen of the Signals ranked as Petty Officers first class, and six years later the rating of Chief Yeoman of Signals was introduced for flagships. After the introduction of flashing at night the need for trained men must have been increasingly evident, and accordingly in 1870 an order in council was issued instituting new ratings of signal boys, 2nd and 3rd class signalmen. At the same time complements of signalmen for all classes of ship were laid down.

Signalling in the Fleet progressed slowly until it received a sudden impetus after the Naval Manœuvres of 1885, when various deficiencies revealed themselves. As a result several important reforms were made. Firstly it was decided that separate Signal Schools were to be established at the three home ports and were to undertake any type of signal training. Hitherto this training had been undertaken partly in the Vernon and partly in the depots, while signalmen at the home ports had been under the general superintendence of the Flag Captain. Special arrangements were also made for an officer to take charge of the instruction after a special course.

Next, the institution of the rank of Signal Boatswain was authorised, and from 1890 for a few years officers of this rank were appointed in charge of the newly instituted Signal Schools. Allowances of pay for instructors and the Signal Boatswains in charge of Signal Schools were also authorised at this time.

In 1895 a Commander was first appointed in charge of the Portsmouth Signal School. It was, however, not until 1906 that officers were officially appointed to undergo a course of training at the Signal School; three were appointed in that year and in 1907 the symbol (S) after an officer's name was first used to indicate qualified in signal duties.

During the early part of this period a Signal Committee, which sat at Devonport, dealt with signal matters in general. In about 1888 this body was renamed the Signal Apparatus Committee, and continued to deal with material up to the time when the work was taken over by the Signal School at Portsmouth.

RECENT DEVELOPMENTS.

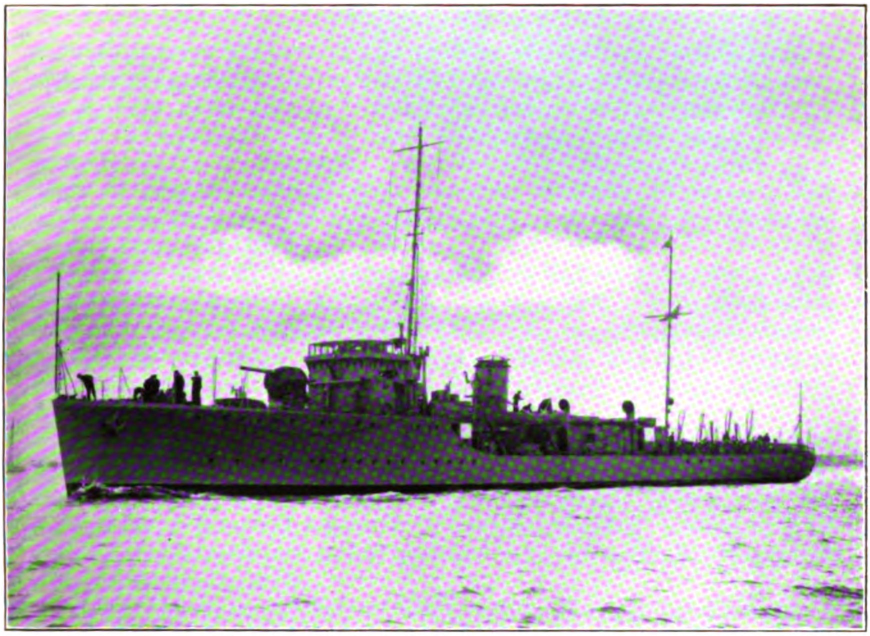
Recent developments in the art of signalling at sea have been chiefly bound up with the introduction of wireless. The general principles of the signal books, flag signalling, and flashing have remained unchanged, though they have naturally developed in many directions to meet changing tactical demands. By day the increasing power of modern electric lights makes it possible for more and more signalling to be done by this means, but the principles remain the same. Wireless has, however, revolutionised communications at sea as elsewhere. Not only can a message be passed rapidly to a ship or aircraft, but given the necessary space there is no difficulty in working several channels of communication simultaneously from the same ship. The modern man-of-war has sets for ordinary communication with the shore, and with other ships, and in addition several channels of communication for manœuvring, reconnaissance, reports, spotting of gunfire, and in fact any other service requiring rapid communication work. Combined with this there is a world-wide network of cable and shore wireless communications.

All this development of communications has had a profound influence on the form of warfare at sea both from the strategical and tactical aspects. Thus a comparison between the state of affairs in Nelson's time and at the present day is of interest. In those days news was slow to travel, and ships themselves travelled slowly. News of enemy movements in distant waters might take months to reach the Admiralty, and when a counter-move was decided on, again months might lapse before a new disposition could be made. The result was great inflexibility compared with present conditions, for to-day news of any event is likely to reach the Admiralty in a few hours, while another few hours are sufficient to set in movement forces in any part of the world.

The strategist of old, by the limitations of his material, was forced to adopt relatively static dispositions to cover the enemy wherever he might be met, whereas the present day strategist can afford to keep his forces concentrated until he is forced to make detachments. Once dispersed, his forces can be readily concentrated again. Good communications are in fact some compensation for lack of numbers.

An example of this tendency is found in the ease with which the movement of Von Spee's squadron was finally countered by a detachment of battle cruisers from the Grand Fleet. Again in the later stages of the Great War the North Atlantic and West Indies could be left without great force, since detachments from the Grand Fleet could readily be sent to deal with any break-through of raiders or units of the High Seas Fleet.

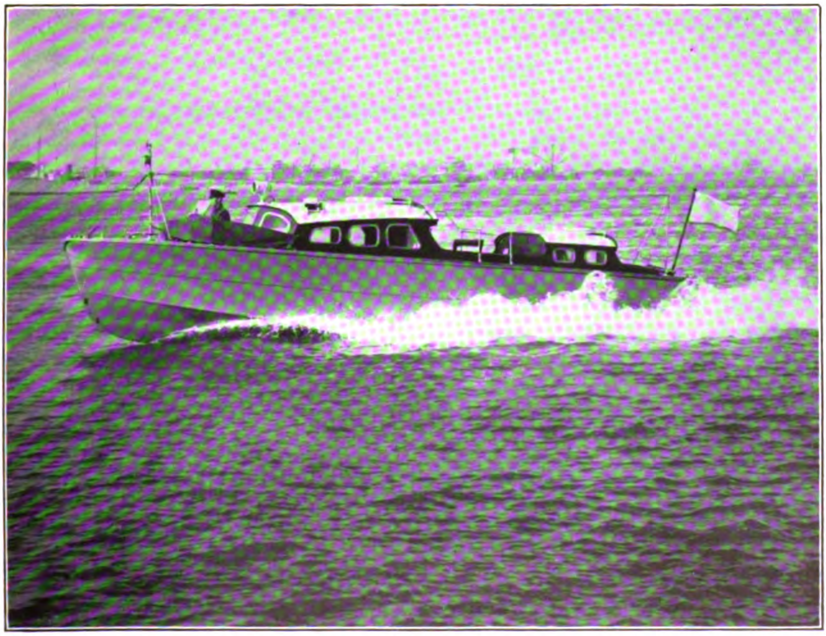
Difficulties at the present day are chiefly caused by a multiplicity rather than a paucity of reports. The strategist of old seemed to be endowed with a quality of intuition enabling him to penetrate the intentions of the enemy. No disparagement is meant by the use of this term, since close study and accurate knowledge of the enemy's



H.M. PATROL VESSEL SHELDRAKE.

Commissioned for Service, July 1, 1937.

(By courtesy of the builders, Messrs. John I. Thornycroft and Co., Ltd., Woolston.)



35-FOOT SHIP'S MOTOR-BOAT.

(By courtesy of the builders, Messrs. Vosper, Ltd., Portsmouth.)

mentality were all part of the process of intuitive reasoning, and though the same attributes may be found in the strategist of to-day, he is likely to be able to base his deductions on far more concrete facts. So much so that he must also possess a great power of discrimination to enable him to sift the wheat from the chaff in a mass of possibly contradictory reports. Rapidity of decision has always been required of any commander, it is even more necessary to-day than ever before.

Turning now to the Admiral at sea, we find that much the same considerations apply. A great mass of information from all sources will pour into his flagship, and thus here again discrimination tends to displace intuition. His control over his fleet will only be limited by the need for caution in the use of his wireless to avoid disclosing his position to the enemy.

Once the enemy is met and battle is joined, he will have complete control of his forces, however far flung, and by the use of the air will have minute to minute news of the doings of the enemy. At the same time events will march with extreme rapidity, and even if he desired to centralise control of his units in his own hands, time would not permit him to do so.

Thus the Commander-in-Chief's influence must be confined to the force with which he is stationed, and the rest of his fleet can only look for general guidance on lines previously decided upon. Details must be left to subordinate commanders. The need for a common doctrine in the handling of the fleet and its units is just as urgent a requirement now as ever it was. There is still scope for the present day equivalent of Nelson's " band of brothers."

PERSONNEL OF THE PRESENT DAY.

In communication as elsewhere, the man ultimately plays an even greater part than the machine. We have already referred to the early signal officers and to the institution of the rating of signalman, and some account must now be given of the present-day situation.

In the Navy Estimates of 1937, provision is made for 37,274 petty officers and seamen, and at the same time for 2,556 signal ratings and 3,512 telegraphists. The figures themselves are illuminating as illustrating the great part that communications play in the modern Navy. No less than 6,000 men are required for communications alone. It is also interesting to note the progress of wireless as shown by the comparison of numbers employed on wireless and visual signalling.

The larger part of the signalmen and telegraphists are drawn from the common pool of seaman boys in the Boys' Training Establishments ashore. Here certain minimum educational standards are required before a boy can enter a signal or a wireless class, but care is taken to ensure that not all the brightest boys are taken into communications. In the selection the boy's own preference is taken into account.

A signal class having been formed after a few weeks, the boys first of all learn practical signalling by semaphore and morse, and at the same time they have their introduction to the signal books and the books of instruction about the various methods of signalling. After three months the class is divided, those who elect and are most suited to become telegraphists are formed into a wireless class, the remainder go on with their training as signal boys for another 32 weeks. The wireless boys now apply themselves more to mathematics and electricity and learn to become practical wireless operators, passing out at the same time as the signal boys. By the end of their shore training the signal boys are fairly proficient in signalling by semaphore and flashing, and the wireless boys in handling a morse key and reading morse. Moreover all should know something about the control and organisation of signalling in the Fleet.

Thus the visual and telegraphist branches tend to diverge, but the fact that they start their careers together in the training establishment is a valuable factor in maintaining harmony later on at sea. On completion of their courses in the training establishment our boys go to a sea-going ship as signal boy or boy telegraphist. There their training is continued, with practical work on the signal bridge or wireless office. The need for continued training at this stage is so great that boys are only sent to the larger ships when there are proper facilities for instruction.

The next step to ordinary signalman or telegraphist is normally on the boys' eighteenth birthday, but exceptionally smart boys may be rated when they are 17½ years old. In nine months' time, six of which must have been at sea, the lad can be rated signalman or telegraphist after passing an examination in his ship.

It is now necessary to digress to explain the system of substantive and non-substantive rates. The substantive rates are those which show a man's capacity in the wide sense of the word. For the Signal Branch they are signal boy, ordinary signalman, signalman, leading signalman, yeoman of signals, and chief yeoman of signals. Similarly for the Wireless Branch they are boy telegraphist, ordinary telegraphist, telegraphist, leading telegraphist, petty officer, and chief petty officer telegraphist. The non-substantive rating, on the other hand, shows the extent of the man's technical knowledge as opposed to his general standing or capacity to take charge. The substantive and non-substantive rates are loosely linked together so that senior ratings must have some technical knowledge, and so that the man who has exceptional technical knowledge but lacks capacity to take charge can be rewarded for his technical ability.

The foundation of all the technical ratings is the trained operator visual (V/S) or wireless (W/T). All signalmen and telegraphists must reach this standard which is the minimum for a rating to take a full time part on the bridge, or in the wireless office.

The next step in rate is to leading signalman or telegraphist. Before being considered for these substantive rates a man must pass an examination at sea or ashore for the non-substantive rate of visual signalman 3rd class or telegraphist 3rd class (V/S 3 or W/T 3). Once passed this examination he will be employed and paid as such until such time as he is recommended for and advanced to leading signalman or leading telegraphist. Similarly the men will then aim at passing, in due course, for the non-substantive rate of V/S 2 or W/T 2, which is the essential qualification for yeoman of signals or petty officer telegraphist. The highest technical qualification is that of V/S 1 or W/T 1, which can be held by any man of exceptional technical qualification, irrespective of his rating. In all cases an advance in technical qualification or in rating carries with it an appropriate increase in pay.

Courses of instruction for the higher ratings can only be held ashore in schools properly equipped for theoretical and practical instruction. It will be realised that a petty officer telegraphist, who may be put in charge of the W/T sets in any class of ship, must have a knowledge of all the sets he is likely to meet, not necessarily a detailed knowledge, but sufficient to enable him to work the set and to find defects with the aid of a handbook. The schools ashore are, therefore, equipped with all the W/T sets, etc., necessary for this type of instruction. Signal schools exist at Portsmouth, Chatham, and Devonport, as well as small training centres abroad. Of these Portsmouth is the most important, and can undertake any form of training. The others can undertake the training of junior ratings.

Besides the continuous service ratings, who sign on for 12 years with a possibility of a further period of 9 years to qualify for a pension, there are also special service ratings who engage for 7 years' service, and then 5 in the reserve. These lads are recruited from every walk of life, and do their initial training in the Royal Naval Barracks at the home ports. They enter at about 19 years of age, and after 45 weeks training, pass out as ordinary signalmen or telegraphists. Thence they go to sea and serve under similar conditions to the continuous service rating.

Once at sea in a battleship, the ratings will find themselves members of a large communication staff, whose duties are the manning of the various lines of communication, both visual and wireless, and the maintenance of the material. Complements vary in different ships, of course, and are based entirely on the numbers of various lines of communication which have to be manned simultaneously. Besides being responsible for the actual despatch and receipt of messages, the signal staff are also responsible for the logging, filing, duplicating, and distribution of signal messages within the ship.

When it is realised that the messages handled in a day in a fleet flagship run into many hundreds, it becomes clear that the work of the signal staff is heavy and responsible, requiring a clear head and marked intelligence, besides considerable technical knowledge. A very slight mistake in reading a message or delay in dealing with it may have vital effects on the course of a campaign.

Besides their ordinary work as members of the signal staff, ratings must put in a considerable amount of private study in order to pass their examinations. In the case of wireless ratings an extra reward comes on leaving the Navy, when any qualified man finds no difficulty in obtaining employment in wireless or kindred trades. Many of the smartest men, however, elect to make the Navy their life career, and pass for the warrant officer grade of Signal Boatswain, or Warrant Telegraphist. These men in due course may become Lieutenants or Lieut.-Commanders of their own branch.

RESERVE PERSONNEL.

No account of modern naval signalling would be complete without reference to the reserves. Besides the normal reserves of men who have completed their term of engagement in the Navy, there exist the R.N. Volunteer Reserve and the R.N. Wireless Auxiliary Reserve.

The activities of the R.N.V.R. are well known. All the various divisions scattered through the country train men for the signal and wireless branches, with, in many cases, a considerable degree of success. The great obstacle to efficiency here is the difficulty of obtaining the constant practice required to ensure that rapid and accurate signalling becomes second nature.

In order to overcome this difficulty, and to tap the large body of wireless amateurs who owned their own sets, the Royal Naval Wireless Auxiliary Reserve was started in 1932. This reserve is organised in groups all over the country, and training is largely carried out by actual communication between amateur-built wireless sets owned by members. The fact that practice can be obtained in or near members' homes makes efficiency easy to attain, and the popularity of the reserve may be judged by the fact that during the few years since its inception, the reserve has steadily increased to practically full strength. Members have certain privileges, in that they are allowed to visit the W/T offices of H.M. ships on production of their badge, and periods of training at the signal schools or at sea have been well attended.

SIGNAL OFFICERS.

The signal officers of the Navy are specialists drawn from the body of the younger officers, in the same manner as gunnery, torpedo or navigation. After one year's rather intensive training at the Signal School, Portsmouth, they become qualified " S " officers, and serve at sea in junior signal appointments on the staff of certain Flag Officers and Captains of destroyer and submarine flotillas. In some of these appointments they serve also as Flag Lieutenants to their Admirals. They are responsible for advising their senior officer on all matters of communication, and under his authority organise the system of communications and all training.

Periods at sea alternate with service ashore in the schools, either instructing or assisting to develop material. Finally as a Lieut.-Commander or Commander the signal officer may be employed as Fleet Signal or Wireless Officer on the staff of a Commander-in-Chief, with great responsibilities for the proper management of his sphere of communication in the Fleet. Subsequently officers usually revert to general service, but may, of course, be required for the higher administrative posts in the Admiralty or in the schools.

COMMUNICATION MATERIAL.

Besides its instructional work the Signal School at Portsmouth has a large department dealing exclusively with material. It is manned partly by civilian scientific and technical officers, and partly by naval officers, and the whole is in charge of a naval officer. The keynote of the organisation is that the scientist and the naval officer should work literally alongside each other to produce signalling material for the Fleet which is not only the most up-to-date that science can produce, but also entirely suitable for the very specialised conditions of a man-of-war at sea. In their work they are guided by lists of requirements issued from time to time by the Admiralty, as a result of sea experience. Thus the work is always kept on severely practical lines.

The early experimental stages of any particular piece of apparatus will probably include trial in the Fleet or in signal school tenders. When these are satisfactory the apparatus can be standardised and brought to the stage where detailed drawings and specifications can be made. All the complete articles are then brought to the signal school for test, and finally fitted in H.M. ships under the superintendance of signal school officers. To do all this work on all signalling apparatus requires the work of a relatively large staff.

ADMIRALTY ORGANISATION.

The Admiralty organisation for dealing with signal matters is centred in the Signal Department, under its Director, who is the advisor to the Board of Admiralty on all matters relating to signalling. He and his department naturally are in the very closest touch with the Signal School at Portsmouth, both as regards personnel and material. The Director of Signal Department is also in close touch with other service departments, the General Post Office, the Cable and Wireless Companies, and the B.B.C., as well as the trade. In addition to his administrative duties regarding personnel and material, the Director of the Signal Department naturally has a considerable say in the Admiralty world-wide system of communications, and in the communication organisation of the various fleets and stations.

To supplement the British world-wide network of cables and wireless, the Admiralty maintains naval shore wireless stations in various strategic centres, particularly in those places where commercial stations would not pay. Most of these stations are in frequent touch with the Admiralty station at Whitehall, and provide a rapid means of sending important messages, while the normal commercial cable and wireless channels can, if need be, deal with the mass of administrative messages.

CONCLUSION.

In this short account of the history and development of naval signalling, an effort has been made to summarise all the important factors. It cannot be doubted that development was inevitable. Improvement in communications has been one of the outstanding factors of the last century, and it would have been manifestly impossible for any fighting service to stand aloof. The military advantages of good communications are obvious; for example, the ability rapidly to transfer ships and men to the vital area is in effect equivalent to providing additional ships and men. In brief, communication is vital to the Navy, that it may play its traditional part as the safeguard on which the strength of the Empire chiefly depends.

J. W. S. DORLING.

CHAPTER VIII.

MEN OF THE MERCHANT NAVY.

"*Your Fleet and your Trade have so near a relation and such mutual influence on each other they cannot well be separated; your Trade is the mother and nurse of your seamen; your seamen are the life of your Fleet; and your Fleet is the security and protection of your Trade; and both together are the wealth, strength, security, and glory of Britain.*"

THE MERCHANT NAVY.

The words quoted above originated from Lord Haversham at the beginning of the eighteenth century. They are as true to-day as when uttered. Throughout our history there have always been good reasons for fostering the growth and development of the Merchant Navy. The wealth that accrued from it was one. Others were the help its ships and men could give in war, and still more the absolute need of it as a nursery for seamen. There were many Acts of Parliament designed to encourage and to help it, chief among them being the successive Navigation Acts introduced between the years 1381 and 1850. The Fishing Fleets were similarly recognised by Edward VI, who maintained and increased the fast days when fish was to be consumed, and Queen Elizabeth who, in 1563, established measures to build up the fisheries,* referred to as the "Petty Navy Royal." There have been many enactments since.

The purpose of all this legislation was to foster the Merchant Navy and the Fishing Fleets by ensuring the necessary markets, and to help the Royal Navy by providing it with a reserve of seamen. Indeed, the Navigation Acts and similar measures may be regarded as an epitome of our traditional sea policy. On the one hand, they recognised the supreme value of the Merchant Navy to the State, and that it was dependent upon the Royal Navy for protection. On the other, they admitted that the Royal Navy was dependent upon merchant seamen and ships for valuable help in war. Thus the two Sea Services have always been interdependent and indivisible, and the gradual growth of a merchant fleet has conduced to the growth of an armed Navy to protect it.

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* "There is a good deal of scattered information about the meals which the prosperous artisan and merchant of the towns ate in late Tudor times. . . . A great deal of fish was eaten, of which a considerable proportion was sea fish brought to port already salted. It was an offence to eat meat on any of the fish days appointed by the Church and on the additional days which the Crown proclaimed as fish days, in order to encourage the building of ships and the training of seamen." (Professor J. C. Drummond, *Journal of the Royal Society of Arts*, No. 4443, Vol. LXXXVI., Jan. 14, 1938).

Nowadays, with a British Commonwealth spread all over the globe, a hugely increased and industrialised home population, and our almost complete dependence upon food and raw materials from oversea, the Merchant Navy means more to us than ever before. Whether one regards it as an essential supply service in peace and in war, or as a source for the provision of the additional officers, men, and ships required for fighting and auxiliary naval purposes during hostilities, the Merchant Navy, with the Fishing Fleet, is every whit as important a component in the scheme of National Defence as is the Navy, the Army, or the Air Force. During the Great War that portion of it which continued to run for the carriage of cargoes and passengers, in convoy or otherwise, became what was virtually a State Service working under a Ministry of Shipping.

MERCHANT VESSELS AND FISHING CRAFT, 1914–18.

How many merchant and fishing vessels, together with privately-owned yachts, motor craft, and the like, were taken over for naval combatant purposes during the Great War it is impossible to estimate without exhaustive and lengthy research. The Navy List for November, 1918, however, shows the names of 84 armed merchant cruisers, armed boarding steamers, and other sizeable vessels flying the White Ensign. Over and above this, 73 closely printed pages in double columns contain the names of a swarm of trawlers, drifters, motor-boats, motor lighters, yachts, and paddle steamers all directly used for naval combatant purposes. A modest estimate is 45 names to the page, which gives a total of 3,825 small craft.

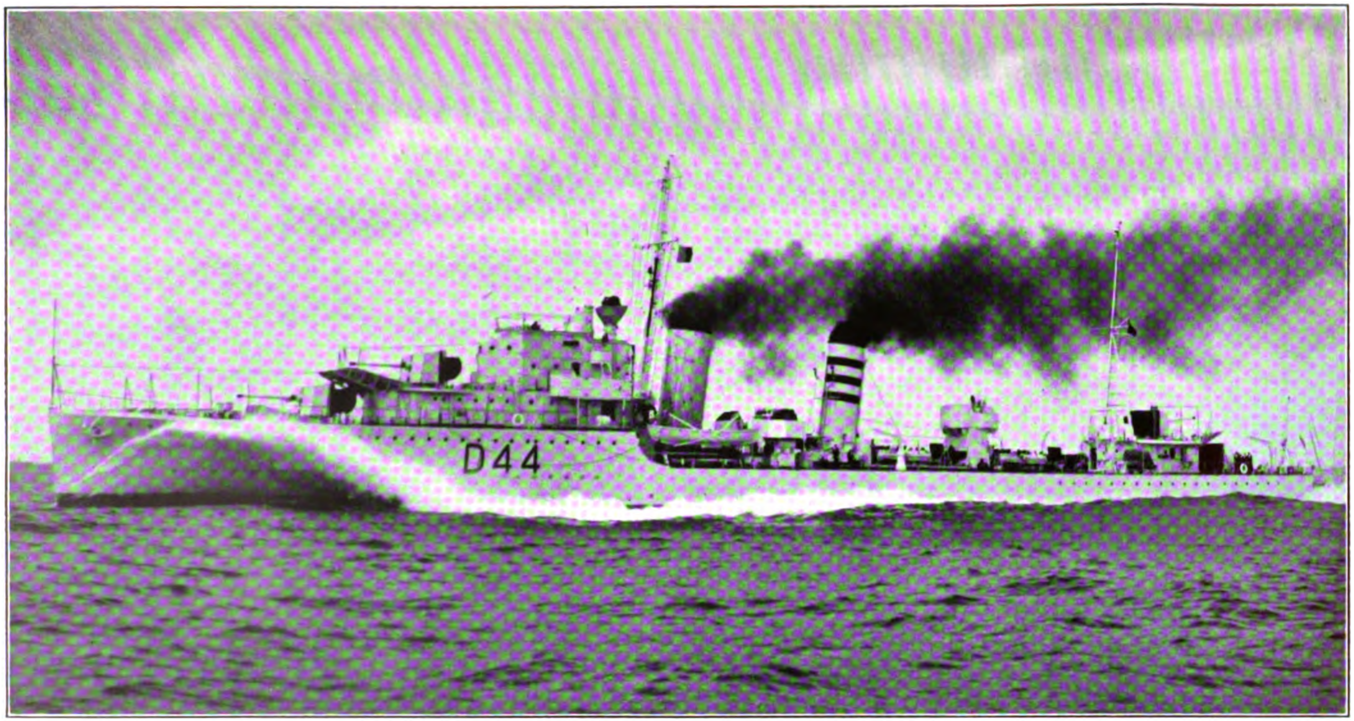
One knows, too, that at the time of the Armistice no less than 412 trawlers and 142 drifters were actually engaged in minesweeping. The actual war losses in requisitioned merchant ships and fishing craft are ascertainable from an official return published by the Stationery Office on August 1, 1919. They amounted to 17 armed merchant cruisers, 13 armed boarding steamers, 1 large minelayer, and 2 aircraft-carriers, to which must be added 264 trawlers, 130 drifters, and 18 paddle or other minesweepers.

In the event of any future hostilities at sea, hundreds of auxiliaries from the Merchant Navy and the Fishing Fleet would still have to be requisitioned for purely naval purposes. Many more would be required for naval supply services with the Fleet operating away from Home Waters. Added to this, the outbreak of war would inevitably produce a heavy programme of new construction.

The Navy cannot hope to man this vast concourse of vessels with its own resources, even with the assistance of its various peace Reserves. Our total naval man-power, including Reserves, suffices only to meet the needs of the Fleet on mobilisation.

NAVAL PERSONNEL: 1914–18; 1937.

Figures convey little to the imagination; but the table on the next page, compiled from official resources, shows the expansion in naval personnel between the outbreak of the Great War and the



H.M. DESTROYER IMOGEN.

Commissioned for Service, June 2, 1937.

(By courtesy of the builders, Messrs. Hawthorn, Leslie & Co., Ltd., Hebburn-on-Tyne.)

Armistice, together with an estimate of the equivalent strength to-day based upon figures given in the Navy Estimates for 1937. The figures for July and August, 1914, are difficult to reconcile. The disparity is probably accounted for by the fact that not all the Reserves were immediately available on mobilisation.

Category.	Numbers.			
	July, 1914.	Serving Aug. 15, 1914.	Nov., 1918.	1937.
Vote A, i.e. Officers, Men, R.N. and Royal Marines, with boys under training.	146,047	147,667	188,537	112,000
Retired Officers and Pensioners . .	?	6,970	12,346	?
Pensioners, R.N. and R.M., under 55	9,110	Included above.	Included above.	25,500
Royal Fleet Reserve	29,033	27,395	19,180	13,052
R.N.R. (including Officers) . . .	19,026	13,510	23,453	9,562
R.N.R. (Trawler Section). (Including Officers.)		3,130	37,145	
R.N.V.R. (including Officers) . .	4,469	2,345	50,218	5,562
Aux. Sick Berth Reserve	1,338	?	?	1,450
R.N. Wireless Aux. Reserve . . .	—	—	—	457
Colonial Reserves	—	—	2,000	?
Men entered for Hostilities only .	—	—	74,437	—
Totals	209,023	201,017	407,316	167,675

The diminution in the numbers borne under Vote A, i.e. the regular personnel, has of course been brought about by the drastic whittling down of the Fleet since 1914. But why, it may be asked, is there a drop of 16,000 odd in the Royal Fleet Reserve, and of about 9,500 in the Royal Naval Reserve ?

The answer is simple. The Admiralty is confident that the present strength of the Reserves of various classes is sufficient for all Fleet purposes on mobilisation. In 1914 we possessed a large number of ships, including over thirty old battleships and many cruisers, in the Second and Third Fleets. These had to be brought up to their full complements, or commissioned, for hostilities. The Reserve Fleet nowadays is of much more modest proportions.

But the table shows that the personnel of the Navy, taken as a whole, increased by something like 200,000 under the stress of war and the necessity of providing men for the huge number of additional ships that were either built or requisitioned for naval purposes. The R.N.R., including the Trawler Section, increased by about

41,500; the R.N.V.R. by 46,000 odd; while over 74,000 civilians were enrolled for service for "hostilities only" and sent to sea after brief, intensive naval training.

EMPLOYMENT OF MERCHANT SHIPS.

All the time the Navy proper was demanding more and more ships and men, our commitments in other directions were prodigious and always increasing. Military expeditions were being sent to various parts of the world, and ships had to transport and provide them with food, stores, and munitions. Simultaneously, the more ordinary trade of the country had to continue.

To take a bird's-eye view of the situation during the intensive submarine campaign of 1917 from the aspect of one responsible for the allocation of British tonnage alone, our troops were fighting in France, Salonika, Palestine, and Mesopotamia. Their transportation from Britain, Australia, Canada, and India needed about 70 ships. Their supply of food, munitions, and clothing, together with material for railways, timber for trenches and hutments, and medical attention for wounded and invalids, necessitated another 335 ships. The raw materials which manufactured their munitions and clothing had to be imported into England, Canada, and America—350 ships. The Royal Navy, at the same time, had to be supplemented by over 100 sizeable ships for fighting purposes, and fuelled and supplied by 300 more. To feed and supply the Home population with the necessaries of life meant another 750 ships. Thus, apart from the multitude of smaller craft, 1,905 sizeable vessels had to be kept running and manned.*

NAVAL PERSONNEL IN PEACE.

As regards the Navy, it must be emphasised that it is as impossible for the Admiralty to estimate and provide during peace the number of men it may eventually require during a protracted and extensive maritime war, as it is for the Army Council to decide beforehand what new Armies would have to be raised for hostilities on land. Nor is it any part of the Admiralty's peace-time business, even if the Treasury was agreeable, to review the matter of the whole available seaman-power of the country, and to spend money from the Navy Estimates on earmarking and training for *possible* naval service all the men it *might* eventually have to call upon. The best the Admiralty can do during peace is to provide the men for the Fleet and its immediate auxiliary services on mobilisation. In short, the regular personnel of the Navy, with the peace reserves, must be capable of meeting the first shock of war. Numbers can never be maintained in peace at a strength sufficient to meet all the demands of new construction, a comprehensive Convoy System, and the miscellaneous and expanded services of hostilities.

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* The details of this paragraph are from an article on the War Control of Shipping by Sir Arthur Salter. "Encyclopædia Britannica," 14th Edition, Vol. 23, p. 338.

MERCHANT SEAMEN.

The matter of whether or not our available strength in merchant seamen is sufficient for a modern war is a matter which the Government, and the Government only, can properly decide. If the number is inadequate, the necessary steps should be taken to supplement them.

Is our seagoing man-power sufficient at present to meet the demands of a war fought on the same scale as that of 1914–1918? The answer, if we are to believe those who are in a position to know, is an emphatic negative. The trained seamen simply do not exist.

Still less have we sufficient men for manning that swarm of naval auxiliaries and supply vessels that would be required if the Fleet was operating away from Home Waters, or in two widely-separated areas like the Mediterranean and the Pacific. The younger men who were at sea during the Great War are ageing, and will not be available for ever. The matter of our total seagoing man-power is as important for our safety as the reinforcement of our Fleet by the present intensive rearmament programme.

THE SHORTAGE OF CARGO SHIPS AND MERCHANT SEAMEN.

Writing in " Brassey's Naval Annual " last year, Mr. E. H. Watts, who besides being a shipowner is Vice-Chairman of the Shipping Federation, estimated that the war shortage in our cargo-carrying fleet is approximately 700 ships; but mentioned that some shipowners would allow 1,000, or even 1,500, as being nearer the figure. He concluded his article by writing that there was " an unanswerable case for the urgent and earnest attention of the Government if the Merchant Navy is to fulfill its function in the Empire's commercial, economic, and naval line of defence." Speaking before the Royal Society of Arts little more than a year ago, the same authority mentioned the acute shortage of merchant seamen. The facts are sufficiently disturbing.

The smaller number of ships now running find it difficult to obtain crews. Ports which officially show hundreds of unemployed seamen sometimes find it impossible to complete a vessel's complement, and have to procure men from all sorts of distant places before she can sail. Skilled men like boatswains, qualified A.B.'s and, junior engineers are practically unobtainable.

An inspection of the weekly reports collected from ports all over the United Kingdom by the Registrars of the Shipping Federation results in some dismal reading. Bristol says " there is a shortage of A.B.'s and ordinary seamen, and we have great difficulty in completing crews." Avonmouth makes much the same complaint, while Cardiff reports white seamen " steadily decreasing " and difficulty in obtaining sufficient deck-hands. Glasgow, Greenock, Falmouth, Plymouth, Leith, Grangemouth, West Hartlepool, Hull, Manchester, Liverpool, Newport, Port Talbot, and Swansea all have the same unhappy tale. There is no doubt whatever that the supply of merchant seamen is insufficient for our present needs, and still shrinking. The lack of them may well prove disastrous in war.

The Ministry of Labour figures of unemployed seamen " available for immediate employment " was shown as 16,932 at thirty-two ports in the United Kingdom for the last week of October, 1936. This figure, however, comprised all those men who had ever followed the sea for a livelihood—deck-hands, engineers, stewards, and cooks, as well as men of all colours and races who might also be British subjects. Hundreds of them might not have made more than one or two voyages, and have given up the sea for good and all. The Shipping Federation's figures for the same ports are the more practical, and in the week in question its total of unemployed seamen was 8,324. Of this number 4,327, or roughly 52 per cent., were firemen, greasers, and trimmers ; and 2,824, about 34 per cent., stewards, cooks, and other men of the catering department. Only 1,153, or about 14 per cent., were deck-hands, and of this number a large proportion could not be considered as trained seamen.

The situation now—December, 1937—is no better. The shortage of men is still acute, and has largely been caused by the recent slump in the world's carrying trade, and the natural unwillingness of young men to risk their careers in what seems to them to be a moribund industry. Our Merchant Navy, with its seamen, has further dwindled in the face of heavily-subsidised foreign competition, and as a result of a " Scrap and Build " policy which, up to a short time ago, required two ships to be broken up for every one built in order that the tramp section of the industry might qualify for a temporary subsidy of £2,000,000.

We are living in a fool's paradise. The Merchant Navy, which means more to this Empire than to any other community in the world, is insufficient to meet the strain of a possible war for which we are building up our other Defence Services. Yet it also is a Defence Service upon which out security depends. Is it too much to ask that, like the Royal Navy, it should be organised in peace for the gravest peril that can befall us—a maritime war of similar magnitude to the last fought in two separate theatres, and with the additional danger of air attack ?

A MINISTRY OF SHIPPING ?

It cannot be inopportune to suggest that some sort of central authority should be constituted for the purpose of co-ordinating the Merchant Navy into our general scheme of defence. If a Ministry of Shipping was necessary during the Great War, it is equally necessary that some similar body on a smaller scale should be re-established at a time when we are preparing in all other directions for the unwelcome possibility of future hostilities. At the moment the Merchant Navy is a maritime Cinderella, nobody's real child. It is represented by a Department of the Board of Trade, and has no Parliamentary or advisory head primarily responsible for its war readiness and well-bearing.

As Mr. E. H. Watts observed a year ago in his address to the

Royal Society of Arts, coal, iron, and steel, jute, patent medicines, and optical instruments, customs and excise—the list might be continued indefinitely—all come under the care of one Minister, the President of the Board of Trade. " Shipping is out of place among these," he added. " It is a full-time job for any one man, particularly in view of the Merchant Service's function in war, for which the President of the Board of Trade cannot be held responsible."

The organisation is already in being in the Marine Department of the Board of Trade. Reinforced as necessary, and put under the control of a Minister with direct access to the Cabinet, would give doubled efficiency. It is not suggested for a moment that the Ministry of Shipping should usurp the functions of the shipping companies in running their vessels during peace; merely that it should prepare the Merchant Navy for possible eventualities, and, in consultation with the Admiralty, the Shipping Federation, and other representative organisations and bodies, recommend measures to bring about an adequate supply of officers and men, and rectify the anomalies which still undoubtedly exist in a Service which can only be considered as nationally important as the Royal Navy itself.

THE R.N.R., R.N.V.R., AND SEA CADET CORPS.

The Admiralty is doing its share in preparing the Merchant Navy for the acid test of war. It has instituted Defence courses for Merchant Naval officers to give them an idea of what may be expected of them during hostilities. Preparations have also doubtless been made for the arming of merchant ships, the requisitioning of those vessels necessary for naval purposes, and the institution of a comprehensive Convoy System. If the money were available, more measures could, and would, undoubtedly be taken to increase the reserves of seamen for the Navy, and still further to foster the sea spirit which undoubtedly exists in the country.

(1) One might suggest the formation of a Supplementary R.N.R. of officers and men of the Merchant Navy who would be required for auxiliary fighting ships and services in war; but, in present conditions, cannot spare the time to undergo the necessary R.N.R. training in peace. Short, intensive courses on the lines of the present Defence Courses might be instituted, with payment for attendance, the grant of R.N.R. ranks and ratings, and the right, if desired, to wear R.N.R. uniform on ceremonial and other official occasions. The conditions and ages of entry now pertaining for the R.N.R. would have to be relaxed.

(2) That section of the R.N.R. drawn from the Fishing Fleets, and intended for service in patrol trawlers, drifters, and minesweepers in war, might well be strengthened. To do this, some sort of naval instructional centres might be instituted at Hull, Grimsby, Yarmouth, Lowestoft, Fleetwood, Aberdeen, Milford Haven, North Shields, and other fishing ports.

I realise the difficulties; but after conversations with trawler owners, skipper, and deep-sea fishermen am aware that it is commonly said in the fishing fraternity itself that the best of the men will not join the R.N.R. during peace. The reason is mainly financial. Skippers of trawlers working in Icelandic and North Russian waters earn anything up to £1,700 or £2,000 a year, while the men are proportionately well paid. They feel a natural hesitation in joining the R.N.R. with the prospect of being paid during training at the far lower rates which pertain in the Royal Navy. Yet, at the moment, many deep-sea and herring fishermen are out of work, and would welcome some form of naval activity.

(3) A large increase in the very valuable R.N.V.R. could be brought about by the formation of further divisions or detachments in places like Portsmouth, Southampton, Reading, Chatham, Plymouth, Cardiff, Yarmouth, Lowestoft, etc., where none exist at present. Arrangements have already been made for the formation of a Royal Naval Volunteer Supplementary Reserve, which consists of a list of gentlemen who volunteer to accept commissions in the R.N.V.R. in time of war, if and when called upon. The response has been good. The scheme, however, might valuably be extended by instituting short courses in weapon and other training, by opening the list to ratings also, by the granting of R.N.V.R. ranks and ratings, and the right to wear uniform while under training. The R.N.V.R. at present, with its strength of 5,562 officers and men, costs the country £85,100 a year, or roughly £17 a man.

(4) The Sea Cadet Corps, maintained by the Navy League and other private organisations, give boys a certain amount of naval and nautical training and the right to wear uniform on ceremonial occasions. The scheme is officially recognised by a capitation grant of 3*s*. 6*d*. a year for each qualified cadet. The total cost in the Navy Estimates for 1937 is quoted at £490, and the total strength as 2791 boys.

In March last it was announced that Lord Nuffield had generously offered the sum of £50,000 towards the extension of the Navy League Sea Cadet Corps if another £100,000 could be raised from other sources. It is understood that Lord Nuffield's offer has since been made unconditional, and that the capitation grant from the Admiralty is likely to be increased.

About 20 per cent. of the Navy League cadets, I am informed, eventually join one or other of the Sea Services, the R.N.V.R., or the Territorial Army. The national utility of the movement is undeniable, and an expansion is much to be desired as providing physical training and mild discipline for an increased number of youths from poorer homes, as well as inculcating something of the sea spirit among the young and forming a potential reserve of seamen. It is a pity, however, that some means cannot be found of continuing the work for those boys who leave their corps without joining one or other of the Services. The case might be met by the expansion of the R.N.V.R. already suggested, and the automatic enrolment therein of sea cadets leaving their corps at the age of 18.

In Germany the boys of the Marine Section of the "Hitler Youth" number 40,000, and automatically transfer to the Marine Section of the brown-shirted "Storm Troops" on reaching the age of 18. These boys' and men's detachments are stationed all over the country, principally on the coast, or on lakes or rivers. With the 60,000 members of the official Navy League, who are all ex-officers or men of the Navy, they are in close contact with the German Admiralty.

Some, if not all of these suggestions will be combated on the score of expense. My answer is that money spent upon preparation for manning the multitudinous auxiliary fighting units which would be required by the Fleet during hostilities, cannot be ill-spent at a time when the Navy itself is being strengthened for possible war.

It takes time to make a seaman, longer still to produce the seaman-technician that modern war demands. One remembers what happened in 1914 when eight railway packets were fitted out and commissioned in a great hurry as fast minesweepers. They were manned by officers with temporary commissions in the R.N.R. without any knowledge of minesweeping, and, with a few exceptions, no previous knowledge of naval work and discipline. The crews were a hybrid collection hastily enrolled under various different scales of pay, some being inexperienced landsmen, and others merchant seamen who had never served in small craft. The men in one small ship were drawn from the Royal Navy, Royal Fleet Reserve, Royal Naval Reserve, Royal Naval Reserve (Trawler Section), and Royal Naval Volunteer Reserve, with Mercantile Marine ratings specially enrolled under a form of contract known as T. 124 Z. They hardly talked the same language, and though their hearts were in the right place, their willing inexperience led to difficulties which it took weeks of hard work, and the judgment of a Solomon, to eradicate. It is wiser, and possibly cheaper in the end, to be prepared beforehand.

FUNCTIONS OF A MINISTRY OF SHIPPING.

Some of the measures already suggested for increasing the strength of the Reserves would have to be considered by a Ministry of Shipping, if such an organisation existed, in conjunction with the Admiralty, the National Maritime Board, Shipping Federation, and the various Merchant Naval officers' and men's associations and unions.

As for the other matters requiring consideration by the Ministry, as such, a few can easily be suggested :—

MERCHANT NAVY AND FISHING FLEETS UNDER SINGLE CONTROL.

Reference to the table already printed shows that the fighting strength of the Navy increased by round about 200,000 officers and men during the Great War, and that, between August, 1914, and the Armistice, reinforcements to the R.N.R. from the Merchant Navy amounted to about 10,000 men, and to the R.N.R. (Trawler Section), from the Fishing Fleets, to 34,000.

Yet nowadays, during peace, the Merchant Navy is represented by a Department of the Board of Trade, while the Fisheries come under the ægis of the Ministry of Agriculture and Fisheries. What logical connection there is between Agriculture and Fisheries it is difficult to understand. The Fisheries, however, were transferred from the Board of Trade to the Board (now Ministry) of Agriculture in 1903.

As the ships and men of both the Merchant Navy and the Fishing Fleets are vital adjuncts in the scheme of National Defence in war, whether used for fighting purposes or for their more ordinary functions of carrying and providing food, it would seem reasonable that their control and war preparation in peace should be vested in one central organisation working under a Minister of Cabinet rank.

Entry and Training of Merchant Naval Officers.

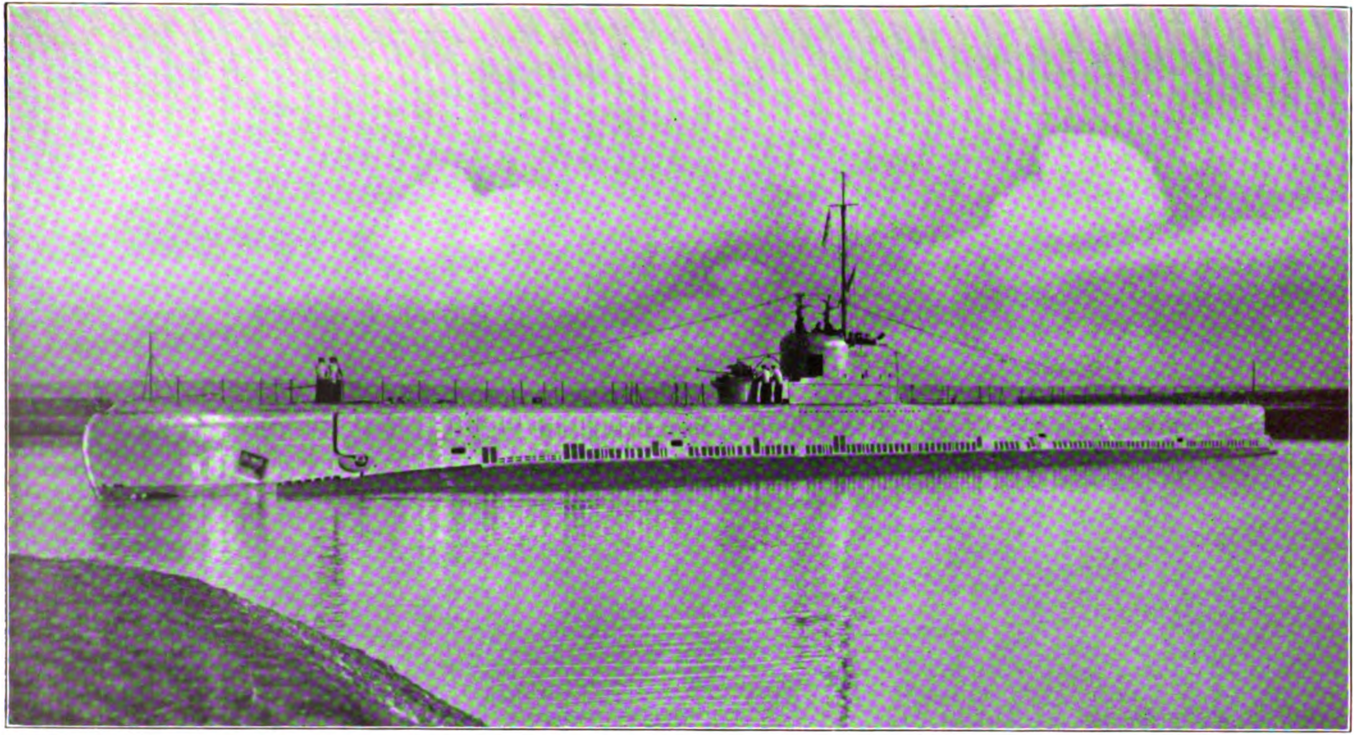
An enquiry into the entry and training of deck officers for the Merchant Navy seems to be long overdue. The matter is too complicated here to be entered into in full detail; but I would draw attention to a report on the training of officers issued on October 9, 1934, by the Advisory Committee appointed by the Manning Committee of the Shipping Federation. I will quote from a few salient passages and comment upon them. (The quotations are in italics).

"*There are three principal institutions which exist for the purpose of training boys who wish to go to sea as officers in the Mercantile Marine . . . There are the Training Ships Conway in the Mersey, Worcester in the Thames, and the Nautical College at Pangbourne. It is outside the function of this Report to deal with these institutions in detail, and it will suffice to say that, in the opinion of the Committee, they are excellent institutions performing a very valuable work, and turning out boys who are much appreciated by ship owners. They provide a pre-apprenticeship training which is probably as good as can be found. It is, however, a training which is only within the reach of parents of considerable means.*"

The boys in these establishments wear R.N.R. uniform and receive a specialised nautical training. A few nominations to the Royal Navy have always been offered, and the number has recently been increased. It was originally intended that the bulk of the remainder should go to sea as apprentices at about the age of 17, with the prospect of passing for second mate after three years afloat.

But the rule no longer holds. Some of the cadets have certainly gone to sea in merchant ships; but of recent years a large proportion have gone into other professions because of the slump in shipping and the difficulty of obtaining appointments, or because life in the Merchant Navy is not sufficiently attractive in the way of future prospects. In consequence, there seems to be a good deal of overlapping and wasted effort, and the Conway, Worcester, and Pangbourne have become what are virtually public schools with a nautical atmosphere.

It is a pity that these excellent establishments, which are doing work of national importance, cannot function in the certainty that



H.M. SUBMARINE RORQUAL.

Completed for Service, February 10, 1937.

(By courtesy of the builders, Vickers-Armstrongs, Ltd., Barrow-in-Furness.)

all their boys will one day become officers at sea. During a recent six months only 43 out of the 335 apprentices going afloat came from the Conway, Worcester, and Pangbourne. The rest entered direct from boarding, technical, secondary, central, or elementary schools. Of the 671 apprentices who were candidates for the second mates' certificate in 1933, the last year for which I possess precise figures, only 109 originally came from the Conway, Worcester, Pangbourne, and other training ships and schools recognised by the Board of Trade.

The Report already quoted provides other figures. Of the 881 apprentices who went to sea in 1933, the indentures of 192 were prematurely terminated. "*It is known,*" it adds, "*that many apprentices give up the sea at the end of their time, and, of course, others take the examination over a year after completing their apprenticeship.*"

Of the 888 candidates examined the first time for the second mates' certificate in 1933, 332, or 37·38 per cent. passed outright; 281, or 31·64 per cent. failed outright; and 275, or 30·96 per cent. failed in one part. Of the 888 first attempts, 487 selected from companies with the largest number of candidates were analysed. The result showed that there were 24·23 per cent. of failures from liners and cargo-liners; 22·58 per cent. from tankers; and 39·87 per cent. from tramps.

Of 100 candidates who took both the oral and written parts of the examination for the second time during 1933, 18 passed outright, 41 failed outright, and 41 failed in one part. "*These figures show that a large number of ex-apprentices, even after a course at a Nautical College following their time at sea, which is the usual practice, are not able to pass the Board of Trade Examination for Second Mate at the first attempt, and that a still smaller percentage pass at the second attempt.*"

The wastage and failures both seem to be unduly high.

Two shipping companies at least, the New Zealand Shipping Company, and the British India Steam Navigation Company, mass their "cadets" 30 or 40 at a time in one or more vessels where they do practically all the deck work, and are given regular and systematic instruction by specially appointed and qualified officers.

Messrs. Alfred Holt and Co., the Blue Funnel Line, also have a comprehensive scheme for the instruction of their "midshipmen," with satisfactory results. Other companies also take steps to train their embryo officers at sea; but, as says the Report, "*there is reason to fear that in some "tramp" steamers apprentices are not regarded as officers in the making, and that insufficient interest in their progress is taken by their employers, and by the officers under whom they work.*"

Tramps and cargo-steamers of 4,000 tons and under make up about 75 per cent. of our British mercantile tonnage. The bulk of apprentices are therefore serving in ships of this description. To mitigate the lack of systematic instruction, the Report of the committee appointed by the Manning Committee of the Shipping Federation suggested that the work should be undertaken by the ships' officers under the general supervision of the masters, who would in turn be responsible to the owners.

The success of the scheme "*will depend almost entirely upon the good will and ability of the ship's officers, and upon the degree of interest which they take, or can be persuaded to take, in the apprentices for whom they are responsible. In these days it is recognised that a teacher needs certain special attributes beyond the mere possession of the knowledge which it is his task to impart . . . A ship's officer cannot be assumed to possess all or any of these attributes. He is not either trained or primarily employed as a teacher, and too much must not be expected of him. The Committee recognise this, but are nevertheless confident from their own experience that when officers understand that their owners expect them to undertake the teaching of their apprentices, and that their progress will be officially tested from time to time, they will rise to the occasion, and that very good results may be expected.*"

I have myself voyaged for four and a half months in one of the New Zealand Shipping Company's cadet ships, and have seen boys under systematic instruction, apart from their ordinary ship's duties. The results were good. Further, I number scores of Merchant Naval Officers among my friends and acquaintances, and have discussed the training scheme suggested by the Shipping Federation's Committee for apprentices in tramp steamers. They one and all hold the same opinion, which, boiled down, resolves itself into this :—

Not all tramp officers, as the Report observes, can be expected to be good teachers, or to possess the tact and patience required for dealing with the young. Moreover, in a tramp carrying a master and three mates, the deck officers are too fully occupied with watchkeeping, cargo work, and the other routine duties of the ship to have any time or real inclination for instructional work.

One officer with whom I discussed the idea, said, in so many words, and very bluntly :—" We are told that the owners *expect* us to undertake this teaching job, and that the progress of the apprentices will be tested from time to time. If the boys don't come up to scratch, *we* shall get it in the neck for failing to teach them. I don't profess to be a blinkin' schoolmaster and didn't sign on as one. Why should the onus and responsibility be thrust upon me when I've already more than enough to do at sea? They don't propose to pay me one bean extra for working overtime. I've eight hours watchkeeping a day, and heaven knows what other jobs connected with the cargo and keeping the ship running and more or less efficient on deck. How the blazes . . .," etc.

He was vehement, and one could but sympathise. The scheme is a pious aspiration, making the best of an admittedly bad job. So long as tramp officers are fully worked, and apprentices over a certain age can be signed on and employed as "efficient deck hands," their instruction in certain classes of ships will continue to be neglected.

Regarding Merchant Naval Officers as a vital component in our panoply of National Defence, I consider that their training should receive a far wider measure of official supervision. Moreover, from the figures and facts already quoted, it seems to be fairly obvious that the present-day training based upon a scheme of apprenticeship which has been in practice for centuries has definitely outlived its usefulness. Except in those companies which provide for the instruction of their young officers, apprenticeship at sea consists mainly in doing the work of an A.B. The real officer's job has to be picked up as best it may.

The Report observes :—" *It is sometimes asserted that apprentices are " cheap labour." This is a plausible assertion which might be made with equal justification of apprentices in any trade or profession. In the great majority of ships the assertion clearly has no justification at all, and it cannot be justified in any case unless it can be shown that the apprentice receives no advantage as compensation for the difference between his wages and those of a forecastle hand. Provided that the boy is receiving a real training, the owner is entitled to the apprentice's services at a wage below a seaman's rate. Practically all apprentices receive wages, but in some cases where a premium is paid no wages as such are paid, but the premium is returned in the course of the apprenticeship.*"

One can agree with this ; but the crux of the matter is that all apprentices are *not* receiving a real training to fit them for their duty as officers. Three or four years spent in long, monotonous voyages, most of the time in painting, scraping, chipping, scrubbing, and other work incidental to the maintenance of a steamer, is soul-destroying and unnecessary for boys who are being trained to be officers. The seamanship part of the work is essential, while a certain amount of the more menial labour can do no harm, as it is part of an officer's duty to supervise the work of his men. Too much of it, on the other hand, induces an A.B. complex and is very much to be deprecated.

In regard to the training of cadets, it may not be out of place to quote some words of that distinguished Frenchman, Marshal Petain, made during a visit to the United States Military Academy at West Point :—" I do not think," he said, " that young men who are being prepared for the duties of an officer should be required to repeat the same gestures every day during four years. That seems to me too long, and I fear that this monotony must result in fixing the graduate's mind into a groove so rigid that elasticity becomes impaired. . . . The object, in two words, is to develop a young man's faculties in such a way as to set him on the road to learning how to become a useful officer . . . The spirit of initiative must be encouraged in him. It must be guided and controlled, of course, but great pains must be taken not to stamp it out."

Those words apply equally well to our Merchant Navy. Under the present apprenticeship scheme there is far too much humdrum labour, far too much wastage of good material. I suggest it would be to the advantage of the Merchant Navy, and would tend to dignify the status of Merchant Naval Officers and bring them more closely into our scheme of National Defence if a Ministry of Shipping enquired into the following points :—

1. The abolition of the present apprenticeship system.
2. Compulsory preliminary nautical training before going to sea at the age of about 17.
3. Twelve to fifteen months at sea in cargo vessels serving as seagoing training ships, and manned entirely by cadets so far as the deck department is concerned. Instructional officers to be carried, and systematic instruction to continue.
4. Eighteen months' service as "midshipmen" or "subordinate officers" in selected vessels, where, four to six in each ship, they should work as junior officers, not deck-hands; should mess with the officers; and concentrate upon their duties as officers, and in navigation, seamanship, cargo work, etc.
5. About six months' instruction and training in approved nautical schools on shore before going up for the second mates' certificate. The curriculum to include a certain amount of elementary weapon training, and instruction in the duties of Merchant Naval Officers in war.
6. Selected officers, according to requirements, to be granted R.N.R. commissions as probationary sub-lieutenants on passing for second mate, and to do the usual R.N.R. courses and training in H.M. Establishments and Ships whenever convenient.

Those not volunteering and selected for the permanent R.N.R. to be placed upon a supplementary list of R.N.R. officers available for service where required in the event of war. These latter to undergo short refresher courses in war duties and weapon training in approved nautical schools when undergoing instruction for the examinations for mate and master later on in their careers.

ENGINEER OFFICERS.

I am not aware how far the scheme outlined above could be applied to Engineer Officers; but they also should belong to the R.N.R., or a supplementary list of R.N.R. officers for war service.

MERCHANT SEAMEN.

Except, possibly, for stewards, cooks, and other men of the catering department, the entry and training of Merchant Naval ratings, both deck and engine-room, might be carried out on a modification of the lines suggested for officers, i.e.:—preliminary training before going to sea, and various trainings and instruction before reaching the equivalent rates of A.B. and petty officer. The same scheme to apply as to enrolment into the R.N.R. or the supplementary list.

In addition to the measures already suggested, the Ministry of Shipping would take over from the Home Office, the Ministry of Health and other Government departments the functions they now exercise in connection with merchant shipping, and would also exercise a general supervision over the matters of pay, accommodation, conditions of service, leave, retirement, pensions, and the like. The pension scheme which has recently been inaugurated for officers might well be extended to the men on the same contributory basis.

The national character of the Merchant Navy might well be recognised by the institution of a long-service decoration for officers, and a long service medal for the men.

I am quite aware that this general scheme, which is not fully worked out and pretends to be nothing more than a basis for discussion, is open to fierce criticism from all sections of the shipping community. I may be accused of wishing to increase taxation by creating a new Government Department, and a new national responsibility in the shape of a State-controlled, or partially State-controlled, personnel for manning the privately-owned ships of the Merchant Navy.

My answer is that the Admiralty is already responsible for the Royal Naval Reserve; the Merchant Navy and Fishing Fleets are already under the legislative control of two separate Government Departments; while the manning of the Merchant Navy is largely in the hands of the Shipping Federation. Pay, conditions of service, and the like are the joint interest of the shipowners' organisations, the National Maritime Board, and the officers' and men's associations and unions.

It is not proposed that the Reserves should be divorced from Admiralty control; merely that the whole of the other seagoing personnel should come under the review of one central authority in order that it may take its proper place in our scheme of National Defence. As to the proposed courses of instruction, etc., and the increased cost of a larger R.N.R., some portion of the expense would naturally fall upon the National Exchequer. The pay of the Merchant Navy, however, would continue to be the responsibility of the shipowners, as it is at present.

I may be told that any attempt at the partial nationalisation of the men of the Merchant Navy is inexpedient and impossible; to that I reply that they are already national in everything but name. At the present moment the Merchant Navy is not a "Service" in the sense that the Royal Navy is a Service, but a series of separate Fleets each under private ownership, each highly specialised, each running in different trades and conditions, and each subject to different rules and regulations. To exist in peace, each of these Fleets have to find ways and means of making a profit, whether they be liners, regular cargo carriers, or tramps.

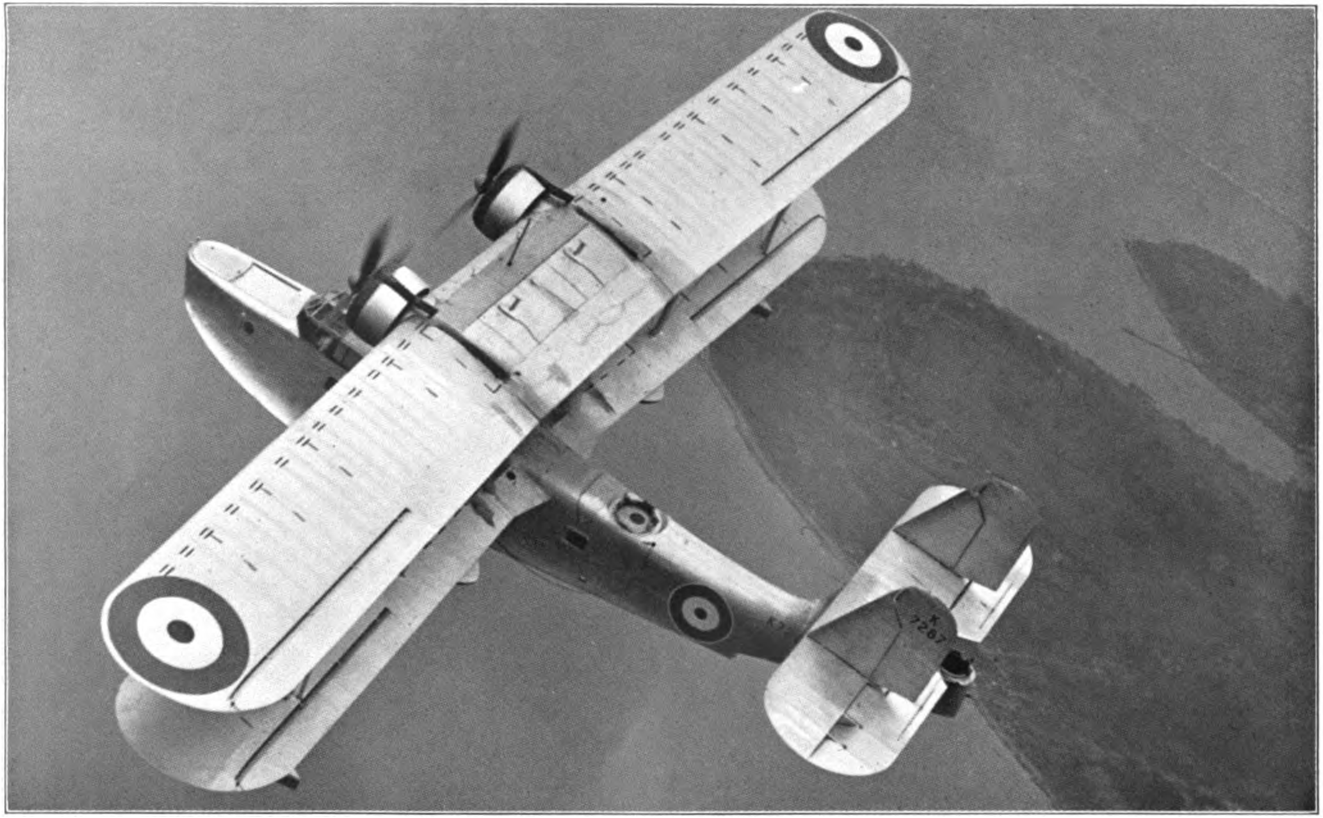
It is the sober and unpalatable truth that the Merchant Navy feels disgruntled and neglected because it is nobody's child, and has nobody primarily responsible for fighting its battles in Parliament. Much has been done in recent years to improve the pay and general conditions of service. Reforms have been instituted, and pensions introduced for officers; but all through the pressure brought to bear by the officers' and men's associations and unions. Much remains to be done, and as an example I might well point to the recent legitimate outcry against the scandal of foreign-owned and foreign-manned ships carrying foreign cargoes being permitted to fly the British flag without a single British subject on board. It is useless to advance the argument that such ships would be useful to us in war. Ships 40 and 50 years old steaming 7 to 9 knots are not the vessels we require for war, and in any case they would re-transfer to a foreign flag the moment hostilities broke out.

No. The Merchant Navy has a tradition as fine as that of the Royal Navy, both in war and in peace. This is generally recognised throughout the country. It is the official recognition that it is so desirable to bring about—that the officers, men, and ships of the Merchant Navy are as important to the defence of the country and the Empire as the Royal Navy, the Army, and the Air Force.

It cannot too often be reiterated that the two Sea Services are interdependent and indivisible. This being the case, everything possible should be done to improve the status and dignity of our Merchant Naval personnel by regulating and co-ordinating the systems of entry and training; by ensuring proper conditions of service and retirement, and generally by perfecting in peace the arrangements whereby, in time of war, the Merchant Navy becomes not merely a National, but also a Fighting Service.

"TAFFRAIL."

NAVAL AIR
SECTION



THE VICKERS-SUPERMARINE "STRANRAER" FLYING-BOAT.

(By courtesy of Messrs. Vickers and "Flight.")

CHAPTER IX.

BRITISH NAVAL AIR PROGRESS.

THE FLEET AIR ARM DECISION.

In the 1937 issue of "Brassey," an account was given of the controversy which had long been going on between the Navy and the Air Force on the question of the organisation of the Fleet Air Arm and of other air units which may operate at sea in war. The controversy is now at an end. In March, 1937, Sir Thomas Inskip, Minister for the Co-ordination of Defence, announced that he was undertaking a systematic enquiry into all the factors involved in the question at issue between the two Services, with the assistance of the Chief of Staffs' Sub-committee of the Committee of Imperial Defence and the other authorities concerned. The enquiry lasted some months, and as its result the decision of the Cabinet was announced by the Prime Minister in the House of Commons on July 30 in the following words:

> The proposals the Government have had under consideration refer to two classes of aircraft. The first class includes all aircraft borne in ships of the Royal Navy. These are known as the Fleet Air Arm. They are under the operational control of the Admiralty, but as part of the Royal Air Force they are under the administrative control of the Air Ministry. The second class includes shore-based aircraft employed in co-operation with naval forces. These are under the operational as well as under the administrative control of the Air Ministry.
>
> Under one proposal which has been before the Government the Admiralty would in each case have been given both the administrative and the operational control, and the whole of the personnel would be naval. The Government have, however, decided that in the case of the second class, namely, shore-based aircraft, which term includes flying-boats, there shall be no alteration in the present system. In the case of the Fleet Air Arm the Government consider that these ship-borne aircraft should be placed under the administrative control of the Admiralty. The necessary steps to give effect to this decision will be taken.
>
> The change can only be carried out gradually, and with the fullest co-operation between the two Services. The same close co-operation between the Services is indeed vital in the whole strategic field where both ships and aircraft are concerned, and I am happy to give the assurance that this co-operation will be forthcoming without reserve.
>
> I wish to make it plain that the decisions which have been reached do not reflect upon the present condition of the Fleet Air Arm, where a keen and efficient service has been built up, but have been reached because the Government believe that the lines now laid down will be the most satisfactory arrangement for the future. I also desire to express the Government's appreciation of the untiring efforts of the Air Ministry to make a success of the system for which they have been responsible. I hope that these decisions which the Government have reached after full enquiry will be accepted in every quarter as a final and satisfactory settlement of a prolonged controversy which it is in the public interest to close.

In reply to questions, the Prime Minister also stated that, in principle, the Fleet Air Arm would have the shore establishments it needed, which would be under the Admiralty.

Discussion between the Admiralty and Air Ministry in order to evolve the measures necessary to give effect to the Government decision has been proceeding ever since the latter was given. Up to the end of the year, no measures had been made public, and in the meanwhile all former orders and organisations remain in force. It is fairly obvious, however, what the arrangements to be adopted must be.

Certain aerodromes and air stations, sufficient to accommodate the squadrons of the Fleet Air Arm when disembarked and to provide for Fleet Air Arm training will be transferred to naval control, so that the Fleet Air Arm will remain at all times under the same authority.

The preliminary flying training of naval officers of the Fleet Air Arm—and, presumably, ratings—is expected to remain under the Air Force, but it is likely to be combined with more " naval air " training than has been possible up to now, and the liaison between the two Services in this respect should be improved. The dual control of the Fleet Air Arm will come to an end, and with it, presumably, the system whereby naval officers are given rank in the Air Force, since there will be no further need for the latter.

For some years, however, until the Fleet Air Arm can overtake arrears of expansion, it seems probable that the services of a number of Air Force officers will be needed by it, just as they are needed now. There should, however, be no difficulty in arranging for this. The officers are serving there now, embarked in H.M. ships and, like every other person, subject to naval discipline while so embarked. The only difference will be, presumably, that when the dual control comes to an end, any Air Force personnel lent to the Navy will remain under naval discipline at all times when so seconded, instead of passing completely out of it when they land their machines on an aerodrome instead of a carrier.

Similarly, the services of aircraft mechanics and riggers from the Air Force will continue to be needed in the Fleet Air Arm until such time as the Navy can recruit and train ratings to replace them. No doubt the assistance of the Air Force in the training of these ratings will be available, though the establishment of the Fleet Air Arm will eventually be large enough to provide for its own training; but even then it would be of advantage, from the point of view not only of efficiency but also of inter-Service co-operation, that there should be an interchange of skilled ratings between the Services.

POLICY.

Various questions of policy consequent upon the change in the status of the Fleet Air Arm remain to be settled. The most important perhaps, is that of personnel. It is perfectly obvious that a large increase in the number of pilots in the Fleet Air Arm must be provided in the not far distant future. The number, given in last years " Brassey," of aircraft embarked in H.M. ships amounted to 176, of which 145 were in carriers and 31 were catapult aircraft carried in fighting ships. There are five aircraft carriers now building, one of which, the Ark Royal, is due to complete in the current year and the remainder in the course of the next two years. Each of the new cruisers to be passed into the Service carries more aircraft than the ship she replaces, while some of them instead of replacing earlier ships are allocated to bring cruiser squadrons up to their earlier strength—as the 2nd Cruiser Squadron of the Home Fleet now comprises five ships instead of four. Every battleship or heavy cruiser reconstructed carries more aircraft than she did before.

With the completion of the new aircraft carriers, some of those now in service will no doubt be placed in reserve; but aircraft carriers in reserve are of no use unless the aircraft which they are to operate on mobilisation are in existence, together with the pilots who are to fly them, the observers who are to be carried in them, and the artificers and craftsmen who are to maintain them. It cannot be an exaggeration, therefore, to estimate the strength of the Fleet Air Arm three years ahead at the equivalent of some 400 machines against the 176 of to-day. Indeed, allowing for the numbers under training for the larger force and the numbers required for administration of the naval shore aerodromes which will then be in existence, the effective strength of naval air personnel may well be even greater. A large expansion in personnel in the near future is thus inevitable.

At present, naval officers provide only 70 per cent. of the pilots of the Fleet Air Arm. As soon as they can be replaced, the R.A.F. pilots will presumably no longer be available. The increase in the number of pilots required is thus even greater than the proportionate material expansion of the Fleet Air Arm. It seems unlikely that this increase can be provided wholly by volunteers from the ordinary Lieutenants list; and if not, the Fleet Air Arm must look elsewhere, in addition, for its pilots.

LOWER DECK PILOTS.

The first and most obvious source of supply is the lower deck. The R.A.F. has long utilised the services of men from the ranks as pilots, as have foreign Services. Many will remember the very efficient "quarter-master" pilots of the French Naval Air Service, who did such sterling work in collaboration with British forces in the Mediterranean during the Great War. It is no secret that the Admiralty have long desired to train Petty Officers and seamen, who volunteer and are found qualified, as pilots, but that that measure is believed to have been vetoed up to now by the Air Ministry, for reasons which have never been made public. In any case, presumably no such veto will be effective under the new organisation, and it is to be expected that the position of pilot will before long be thrown open to the naval ratings, as it has for years been open to non-commissioned officers and men of the R.A.F.*

* An official announcement to this effect was made on March 5, 1838.

OTHER SOURCES OF PILOTS.

Even the extension to the lower deck of the opportunity to qualify as pilot hardly seems likely to provide the full numbers required. It will therefore be necessary to look elsewhere. Specialisation as pilot is already open to officers on the Supplementary list, and there may well be other officers of the Royal Naval Reserve, who are not willing to transfer permanently to the Navy, who would spend a few years flying before reverting to the more humdrum life of the Merchant Navy officer. The officer ranks of the Royal Naval Volunteer Reserve may also prove a possible source of pilots. They might even be entered direct from the shore, under a scheme similar to the R.A.F. system of short service commissions; provided that their whole training and service were with the Navy, they should reach a good standard of efficiency.

The drawback of all systems of short service is—as has been demonstrated in the Army and Air Force—that it is a discouragement to those entered under them when the prospect approaches of being discharged from the Service, and having to start afresh to make a new career for themselves. This is a very real difficulty, and it is perhaps more insistent in a flying service than in any other. Flying is, on the whole, a young man's job, and it is very difficult so to organise a flying service that it will provide a due flow of promotion for the large numbers of young men it needs, or so that it can absorb them into the higher ranks and find work for them. This difficulty will be eased, for the Fleet Air Arm, by the new regime, which will demand the services in Naval Aerodromes of many officers who need not be fully qualified sea officers. But it will still remain a difficult problem, which will require very careful handling.

EXCHANGE OF OFFICERS.

Another question of policy that remains to be decided is the extent to which exchange of officers will be permitted, or encouraged, between the Services. Even though the Fleet Air Arm is to become wholly naval in the future, as already noted, it will for some time yet need the services of R.A.F. officers which it at present enjoys. And even when it is self-sufficient, there will always be room for any R.A.F. officers who desire to serve at sea for a time.

Much is heard to-day in many quarters of the need for inter-Service co-operation and collaboration: the chief obstacles to their full achievement are lack of experience of each Service by the other, and consequent lack of mutual understanding. There is no better way of improving the mutual understanding from which co-operation springs than by providing the experience. That could be done by sending naval officers, qualified as pilots of course, to serve for a time with R.A.F. units, and R.A.F. officers to serve in the Fleet Air Arm. There is no surer guarantee of sympathy between the Services than ensuring that some officers at least in each shall have that knowledge of the other's difficulties which comes from sharing them.

It will be objected, of course, that neither Service can spare the time; that it is a full-time job in either for an officer to make himself fully efficient in it, and that time spent away from his real job is wasted. These objections, however, do not apply in full force to exchange between the Fleet Air Arm and the R.A.F., for many units of the latter have war-time duties closely approximating to those of the former. The flying-boats remain under the R.A.F., but both they and other General Reconnaissance Squadrons will be employed on naval duties in war, as Nos. 209 and 210 Squadrons were employed in the Mediterranean anti-piracy patrol in the autumn of 1937. These R.A.F. units need all the sea training they can get, and can derive nothing but benefit from having naval officers serving with them, and from their own officers serving with the Fleet Air Arm. Similarly, the Navy benefits from the experience gained by naval officers serving with the R.A.F.

The question does not arise immediately. It is one for the future when the new regime for the Fleet Air Arm is in full working. But it is to be hoped that it will be kept in sight.

EXCHANGE OF RATINGS.

The question of exchange of ratings—"other ranks," in R.A.F. parlance—on the other hand, does arise forthwith. It seems essential that R.A.F. mechanics will have to be lent to the Fleet Air Arm for some time to come, until sufficient artificers of the Navy can be trained to take their place. Similarly, the special training of naval artificers, who are already fully qualified engine fitters, in the maintenance and repair of aero engines can presumably best be carried out by attachment to the R.A.F. The absolute necessity for this interchange will cease with the achievement by the Navy of a sufficiency of aero-trained artificers; but it is to be hoped that it will not then be dropped. Anything which tends to increase the practical liaison between the Services is to be encouraged.

SPECIALISATION OF (E) OFFICERS.

There are no officers in the R.A.F. quite corresponding to naval engineer officers. Certain R.A.F. officers do specialise in engineering, but that does not entail a five-year qualifying course in engineering such as that undergone by the Navy's engineers; it entails merely a course of a few months for officers whose chief duty, for which they have been trained, remains that of pilot. Nevertheless, it will probably be considered desirable that a certain number of naval engineer officers should specialise in aero engine work, for duty with the Fleet Air Arm. The fact that the Navy will eventually have to train its own artificers in aero work would make that necessary, even if it were not desirable for other reasons.

SPECIALISATION IN THE R.A.F.

A reversal of the policy which had hitherto governed the training, administration, and organisation of the Royal Air Force was effected during 1937. Up to that year, driven by the necessity of making provision for diverse duties with a very small force, the R.A.F. had maintained the principle that every pilot must be prepared to undertake any sort of flying duty to which he might be allocated. He was required to be adept alike at air fighting, bombing, Army co-operation, general reconnaissance (which includes both the operation of flying-boats and co-operation with naval forces by either land or sea machines), and torpedo-bombing. It was the maintenance of this principle which caused a large part of the difference of opinion between the Admiralty and the Air Ministry, as noted in this chapter in last year's "Brassey," as long as the dual control of Fleet Air Arm persisted. For the Admiralty held, as a result of experience of the Fleet Air Arm, that in it, as well in torpedo-bombing by shore-based squadrons and in the sea part of "general reconnaissance" duties, full-time sea training was essential.

The expansion of the Royal Air Force has now made it possible for the Air Ministry to adopt the measure of specialisation which was denied to them during the years of economy. Pilots are now earmarked, during their early training, for the one of the above five categories of flying duties for which they show most aptitude. Short-service officers, who serve only four years with the Colours, will in future spend the whole of their effective service in one branch. Officers on the permanent list will not be so rigidly differentiated and later in their service will do periods of duty with squadrons other than those of their speciality. But the passing away of the necessity for constant shifting of pilots from one duty to another should do much to eliminate the causes of difference between the Services. And less should be heard of the naval demand for full control of all shore-based squadrons that will operate at sea in war, now that the personnel of those squadrons are to devote their whole time to their special work, without the liability to be suddenly removed for other duty and replaced by those who have no knowledge or experience of it.

FLEET AIR ARM DISPOSITION.

The disposition of the Fleet Air Arm at the end of 1937 was as follows:

CARRIER-BORNE UNITS.

Courageous. (Flag of Rear-Admiral, Aircraft Carriers.)
    No. 800 Fighter Squadron.
    No. 810 Torpedo Reconnaissance Squadron.
    No. 820 Torpedo Spotter Reconnaissance Squadron.
    No. 821 Torpedo Spotter Reconnaissance Squadron.

Furious. Home Fleet.
    No. 801 Fighter Squadron.
    No. 811 Torpedo Reconnaissance Squadron.
    No. 822 Torpedo Spotter Reconnaissance Squadron.

Glorious. Mediterranean.
    No. 802 Fighter Squadron.
    No. 812 Torpedo Spotter Reconnaissance Squadron.
    No. 823 Torpedo Spotter Reconnaissance Squadron.
    No. 825 Torpedo Spotter Reconnaissance Squadron.

Eagle. China.
    No. 813 Torpedo Spotter Reconnaissance Squadron.
    No. 824 Torpedo Spotter Reconnaissance Squadron.

The Courageous is reckoned as a unit of the Home Fleet, but she spends a part of the year in the Mediterranean, during which the Glorious comes under the orders of the Rear-Admiral, Aircraft Carriers. The Furious is a unit of the Home Fleet, but she is employed almost exclusively on the training of pilots.

MAN-OF-WAR-BORNE UNITS.

- 2nd Battle Squadron, Home Fleet.
  - No. 702 Spotter Reconnaissance Flight.
- 2nd Cruiser Squadron, Home Fleet.
  - No. 712 Fighter Reconnaissance Squadron.
- 1st Battle Squadron, Mediterranean.
  - No. 701 Fighter Reconnaissance Flight.
- Battle Cruiser Squadron, Mediterranean.
  - No. 705 Fighter Reconnaissance Flight.
- 1st Cruiser Squadron, Mediterranean.
  - No. 711 Fighter Reconnaissance Flight.
- 3rd Cruiser Squadron, Mediterranean.
  - No. 713 Fighter Reconnaissance Flight.
- 4th Cruiser Squadron, East Indies.
  - No. 714 Fighter Reconnaissance Flight.
- 5th Cruiser Squadron, China.
  - No. 715 Fighter Reconnaissance Squadron.
- 6th Cruiser Squadron, Africa.
  - No. 716 Fighter Reconnaissance Flight.
- 8th Cruiser Squadron, America.
  - No. 718 Fighter Reconnaissance Squadron.
- New Zealand Division.
  - No. 720 Fighter Reconnaissance Flight.

This disposition differs hardly at all from that of a year earlier. There must obviously have been some expansion within the units, but as the numbers and types of machines with which each is equipped are no longer made public, exact comparison is not possible. Some indication, however, is given in the published facts. The 2nd Cruiser Squadron, for instance, is now composed of four ships of the "Southampton" class and the Cornwall, as against four ships of the "Leander" class a year ago. The Southampton can carry three aircraft, and the Cornwall, after reconstruction, four, as against the one each of the "Leander" class. Thus No. 712 Squadron may well have more than doubled its effective strength in the course of 1937, if it has been kept up to establishment. The same is true of various other catapult units of the Fleet Air Arm.

RECENT PROGRESS IN EQUIPPING THE FLEET.

No details can be given of the actual numbers of aircraft of the various types in service, they are not now made public. From time to time, however, the introduction of a new type is announced. Two of these, the Fairey "Seafox" and the Blackburn "Skua," both illustrated in this volume, have made their appearance in 1937.

The Fairey "Seafox" is a "Light Reconnaissance" seaplane, designed specially for catapulting and for hoisting in from the sea by the parent ship. For the latter purpose, the wing-tips are detachable, so that they can be easily replaced if damaged in the hoisting-in process. The undercarriage has spring floats. The details of the "Seafox," given in the Press on its appearance, are as follows :—

Span, 40 feet.
Length, 32 feet 5½ inches.
Height, 12 feet 1 inch.
Wing area, 434 sq. ft.
Loaded weight, 5,420 lb.
Disposable Load (pilot, fuel, and oil excluded), 642 lb.
Engine, 16-cylinder Rapier, 350 h.p.
Speed at sea level, 120 m.p.h.
Initial rate of climb, 420 feet per min.
Rate of climb to 10,000 feet, 150 feet per min.
Time to 5,000 feet, 10·4 min.
Service ceiling, 11,000 feet.
Absolute ceiling, 12,000 feet.
Range, 440 miles.

Very few details are yet available regarding the Blackburn "Skua." It was originally designed for a sleeve-valve Perseus engine. It is an all-metal low-wing monoplane with enclosed cockpit and water-tight fuselage. A De Havilland two-position airscrew and wing-flaps are fitted, the latter to be used when dive-bombing.

PERSONNEL.

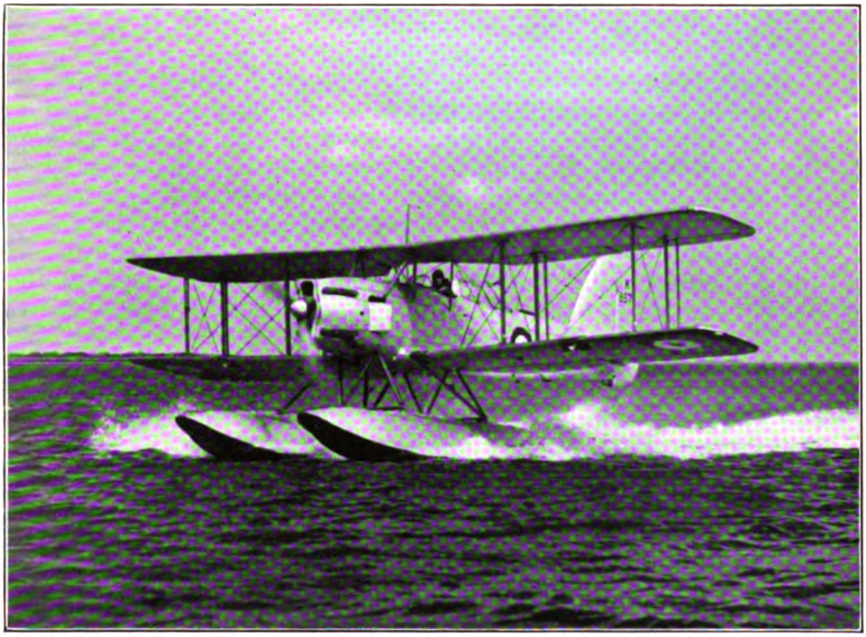
After the publication of the decision to change the status of the Fleet Air Arm, on August 19, 1937, the Admiralty announced the appointment of Rear-Admiral J. H. D. Cunningham, C.B., M.V.O., who had been Assistant Chief of the Naval Staff, with a seat on the Board, since October 1936, to be Assistant Chief of the Naval Staff (Air), with a seat on the Board. At the same time, the appointment of Captain L. E. Holland to be A.C.N.S. (but not a member of the Board) was also made public. No further explanation of these appointments was given, but it was known that the effect of the change was that Rear-Admiral Cunningham was relieved of all his former duties in connection with training and exercises in order that he might devote all his attention to the reorganisation and development of the Fleet Air Arm. Since 1919, all Air matters coming before the Board had been dealt with, in the first instance, by the A.C.N.S., so that the appointment indicated continuity rather than the reverse.

In July, Rear-Admiral G. C. C. Royle, C.B., C.M.G., relieved Vice-Admiral N. F. Laurence, C.B., D.S.O., as Rear-Admiral Commanding Aircraft Carriers.

NEW DEVELOPMENTS.

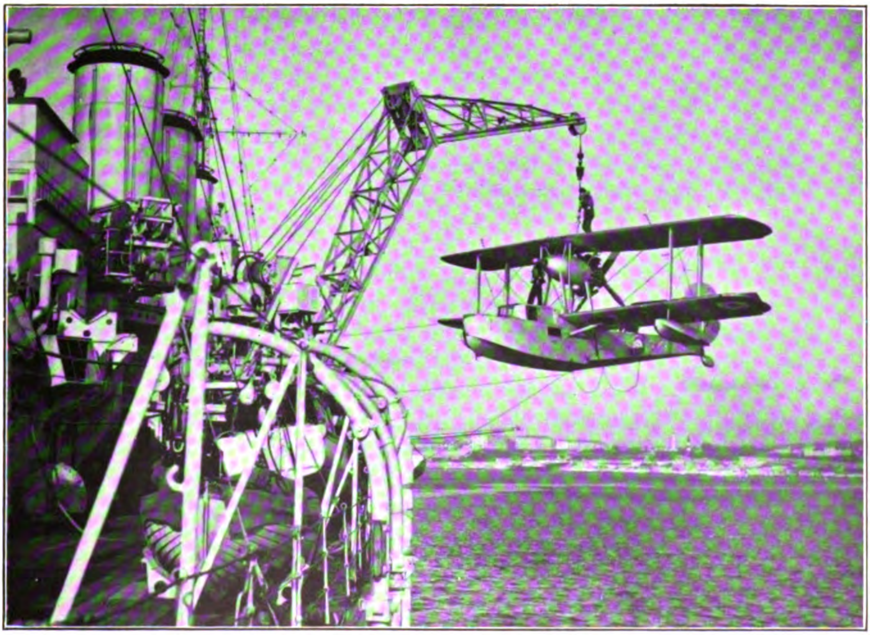
AUTO-GYROS.

Several new models of rotating-wing aircraft have seen the light during the year. The Nagler "Heliogyro," with a single 2-bladed rotor and a pusher air-screw, was demonstrated in England early in 1937. It can be flown either as a helicopter or as auto-gyro. The Focke-Wulf helicopter has two rotors, above and on each side of the body. It can rise and descend vertically, has a speed of 76



THE FAIREY "SEAFOX" LIGHT RECONNAISSANCE SEAPLANE.

(By courtesy of Messrs. Fairey and "Flight.")



THE VICKERS-SUPERMARINE "WALRUS" AMPHIBIAN FLYING-BOAT.

Being hoisted on board H.M.S. Devonshire.

(Photographs by Chas. E. Brown, by courtesy of Messrs. Vickers.)

m.p.h., and can reach a height of some 8,000 feet. The Cierva new model auto-gyro is fitted with an "autodynamic" rotor head. With this device, the rotor blades are feathered while the rotor is being run up to more than its normal speed by power. On declutching, the blades automatically return to their normal pitch for flying, and the energy stored in the rotor revolving above its speed lifts the aircraft into the air in the process of decelerating to normal, so that the machine makes what has come to be known as a "jump-start." As soon as it is off the ground the airscrew takes charge and the machine climbs in the ordinary way. The Weir Gyroplane, driven by a 45-H.P. Weir engine, and the Hafnir Gyroplane, with an adjustable pitch rotor, have also been demonstrated during the year.

The progress which has been made with these machines has been chiefly in the direction of lessening the space they require for landing on or taking off. Several of them have already reached the stage at which there should be little difficulty in using them from a ship with no special fittings beyond a not very large clear space of open deck. None of them has been so used, but that is due chiefly to the fact that all the Services in this country are preoccupied, to the full extent of their resources, with expansion under the re-armament programme. But this form of aircraft has distinct possibilities for naval work.

The ability to hover, combined with speed up to 60 or 70 knots and the ability to operate from the deck of, say, an escort vessel or "armed boarding steamer" are qualities which might in certain conditions make them exceedingly useful in anti-submarine operations. They lend themselves to improvisation to an extent much greater than do aircraft of conventional design. Thus, though it is improbable that much will be done at present to adapt them for naval use, the Admiralty will no doubt keep a watchful eye on their development with a view to their utilisation, if the circumstances should arise, in war.

NIGHT FLYING.

Night flying practice from carriers has been continued during the year and progress has been made in the art. It seems still doubtful whether it will be practicable, in war, to utilise it more than very rarely, on account of the necessity for a lighted flying deck when landing on. Blind landing on aerodromes in fog is now a possibility, given the elaborate equipment and very skilful pilots. When the same principle can be applied to the carrier's decks, night operation from carriers will become a practicable proceeding in war.

QUEEN BEES.

The Airspeed "Queen Wasp" was shown at the Royal Air Force Display in 1937. It is fitted with a 355-H.P. Siddeley Cheetah IX radial engine, and has, no doubt, a better performance than the older "Queen Bees." Practice against "Queen Bees" has now become a regular feature of ships' firings, and its value in improving the A.A. gunnery of the fleet is immense. The Argus, which after her refit is to be utilised entirely for the operation of " Queen Bees," should be commissioned in 1938.

EXERCISES.

SINGAPORE.

The usual Combined Exercises took place at Singapore early in February, the attackers being provided by the China Fleet, which then included the aircraft-carrier Hermes (since relieved by the Eagle), and the defences being reinforced by units from Egypt and Irak. The defences proved themselves quite capable of locating and engaging sea-borne attack. The Hermes was bombed and attacked with torpedoes by the shore-based air forces while still 180 miles distant from Singapore, and the weather being fine, all the attacking units were located and attacked, by aircraft, surface craft, and submarines, during their approach.

HONG KONG.

A similar exercise was carried out at Hong Kong in the following month, the garrison being reinforced by No. 230 (G.R.) Squadron (then entitled an F.B. Squadron) of four " Singapore III " flying-boats. On their passage there, they were compelled by bad weather to take shelter in a bay in the island of Tong Ho, 50 miles short of their destination. Two destroyers were sent from Hong Kong to stand by them until the weather moderated, and they arrived safely at their destination after a day's delay.

MEDITERRANEAN.

In January, four " Saro London " flying-boats of No. 201 Squadron paid a visit to the Mediterranean. Air Marshal Joubert de la Ferté, then Air Officer Commanding-in-Chief, Coastal Command, accompanied the Squadron. It had been intended that the Squadron should co-operate with the fleet during the spring cruise, but bad weather made that impossible. Malta, Algiers, Gibraltar, and Lisbon were visited before the Squadron returned home.

HOME WATERS.

Two exercises of major importance in which air forces were engaged took place in home waters during the summer.

TRADE DEFENCE EXERCISE.

In this exercise, two raiders coming from the west were supposed to be at large in the western approaches to the British Isles. One of them was the cruiser Southampton, Rear-Admiral Calvert; the other an armed and disguised merchant ship, represented by the oiler Prestol. The defending force, under Rear-Admiral Binney, consisted of the Glorious and her aircraft, the cruiser Newcastle, the destroyer Brazen representing a sister ship to the Newcastle, and eight flying boats provided by Nos. 201, 209 and 228 Squadrons, working from Plymouth and Scilly. The exercise lasted a week, from June 28 to July 4.

The co-operation of British Merchant Shipping in the manœuvre area was enlisted in order to provide an element of reality. Merchant ships were not delayed, but after having been approached by one of the " enemy," they were requested to fly a special flag showing that they had been " sunk," so that they should not be counted twice over. The procedure for " capture " was as follows, the raider, having closed a merchant-ship and requested her to hoist the " sunk " flag, broadcast a wireless message such as a merchant ship suddenly confronted with an enemy might be expected to get out—it might be complete, cut short, or mutilated. She then had to remain in the vicinity of the position for 45 minutes, to represent the time taken to transfer the ship's company of the prize to a place of safety, after which she was free to go off in search of other prey.

Since the defenders were so few, it was evident that they would have to rely chiefly on air reconnaissance, coupled with reports from victims, for locating the enemy raiders. Admiral Binney, whose flag was in the Glorious, therefore placed himself with one of his two cruisers so as to cover the southern trade routes converging on the Channel, and sent the Newcastle to the north-west, to deal with raiders on the North American routes. The flying-boats from Scilly were to carry out a search to the westward over the North American routes; those from Plymouth were to search the South American and southern approach routes.

On the first day the Southampton began operations by making a capture on one of the southern routes, a quarter of an hour after the exercise started. The wireless report was made, though without giving a position, and in consequence the two searching flights sent off by the Glorious failed to locate the enemy. Five hours later the Southampton made another capture, but although a position was given this time, wrong deductions were made as to Southampton's movements, and still she was not located. Three hours later, at 2.10 p.m., yet another capture was made, but it was not until four o'clock that a third reconnaissance flight could be despatched. This finally located the Southampton at five-fifteen, whereupon a striking force of 18 aircraft was sent off from the Glorious. They attacked the Southampton at half-past six, and she was adjudged sunk.

In the meanwhile, the flying-boat patrol from Scilly had located the Prestol at noon, just inside the western limit of the exercise area, had penetrated her disguise—which was not very effective—photographed, and bombed her. The Prestol retired to change her disguise.

On the second day all air forces and cruisers concentrated on the search for the Prestol. Weather prevented the flying-boats at Scilly from taking off until 2 p.m., but they joined in then. The search was fruitless, but on the other hand as the Prestol made no captures, no damage was done to trade.

On the third day strong winds compelled the abandonment of the flying-boat base at Scilly, and prevented their operating. From 9.30 a.m. low visibility prevented all flying. The Newcastle, however, was fortunate enough to sight the Prestol in the haze at 4 p.m., after she had made a capture at eight in the morning, and she was then put out of action.

Both raiders were then resurrected so that the exercise might be continued on the remaining four days available, starting at 4 p.m. on the Thursday. At 7 p.m. the Prestol "captured" the Queen Mary and at 8 p.m. the Southampton sank a merchant ship some 50 miles to the south, but it was too late in the day for either of them to be located by air forces. The next day visibility was too low for any flying, but it also prevented any captures being made. On the next day it was still impossible for the Glorious's aircraft to fly until 6.30 p.m., but flying-boats worked from Plymouth. The Southampton made a capture off Ushant, and the Prestol made several in the approaches to the Bristol Channel, but neither was located by air. The Brazen, by pure chance, sighted the Southampton, but was shaken off in low visibility.

On the last day weather was fully suitable for flying, with the result that both raiders were located and destroyed before the end of the day. Some 16 merchant ships, totalling 175,000 tons, were destroyed by them in the week's exercise.

Peace-time precautions, of course, often prevent flying at sea in conditions in which it would be carried out in war. Nevertheless, the number of days in which, even in the height of summer, no air reconnaissance was available is a clear demonstration of the limitations of the Air Arm at sea. On the other hand, its efficiency and utility on the days when it is available are an immense advantage in the defence of trade, and a great handicap to the commerce raider.

COAST DEFENCE EXERCISE.

This exercise took place on July 14, 15 and 16. The attacking force consisted of the whole available part of the Home Fleet (of which the battleships represented cruisers), and the object of the exercise was to exercise the command and co-ordination of the defences—sea, land, and air—of the three fortresses of Plymouth, Portland, and Portsmouth. The Regular Army units of the fixed defences, Territorial artillery and anti-aircraft units, the local defence destroyers, patrol vessels, anti-submarine trawlers, and the following units of the R.A.F., formed the defending forces.

	Type of Aircraft.
Nos. 201 and 204 (F.B.) Squadrons	"London."
Nos. 209 and 210 (F.B.) „	"Singapore."
Nos. 22 and 42 (T.B.) „	"Vildebeest."
No. 99 (B.) „	"Heyford."
Nos. 206, 220, and 269 (G.R.) „	"Anson."
No. 1 and 74 (F.) „	"Fury" and "Gauntlet."

Together with four aircraft for coast artillery co-operation.

A test of the air-raid precautions' organisation in the Portsmouth–Southampton area was carried out in the course of the exercise.

The attackers were supposed to have come from an imaginary country, 600 miles to the westward of the Channel approaches. Thus any force attacking Portland or Portsmouth would be well within range of the defenders' air reconnaissance while still 300 miles short of their objective. This circumstance should have provided opportunity for co-operation between the air and submarine forces of the defenders, but the short duration of the exercise and the bad weather which prevailed during the latter two-thirds of it gave no opportunity. The operations were not very realistic on the attackers' side, but that is inevitable in such exercises; the defences can only be mobilised for a limited period, during which it is necessary to provide them with plenty of targets for their instruction. Nevertheless, such exercises are an essential test of the organisation of the defences and of the efficacy of the arrangements designed to co-ordinate different forces.

The weather on the first day was favourable to the defence, and within a few hours of the beginning of the exercise all the approaching naval forces had been located, all by flying-boats. Three Anson squadrons were sent off to attack, being diverted from their first target of cruisers to the aircraft carrier which was located after they had started. The Torpedo Bomber Squadron also got in an attack on the carrier while still 30 miles southward of the Lizard.

That night aircraft from the Courageous and Furious delivered bomb attacks on Southampton and Plymouth respectively—this was a case in which night flying from carriers, though risky, would certainly have been a practicable war operation. The carriers had both been heavily bombed by the defending aircraft during the preceding day, but casualties were not inflicted as that would have prevented useful practice. The shore batteries at Plymouth and Portsmouth were also attacked from the sea during the night.

During the following day, attacks were made at dawn on the local defence flotillas at the ports, the attackers claiming to have caught them napping. The weather began to deteriorate in the course of the day. One squadron of " Ospreys " from the Furious delivered an attack on Mount Batten station from across the land, and caught four flying-boats at their moorings. No. 99 Squadron of 12 " Heyfords " was sent off from Wiltshire to attack the Furious off the Bristol Channel, but they struck bad weather and thunderstorms, were dispersed, lost their way, and only got back with difficulty, one machine crashing in Somerset.

The next day the weather was even worse. Similar attacks on both sides were repeated, but the landing projected had to be abandoned on account of heavy rain and freshening westerly wind. The weather, indeed, caused the cancellation of the exercise several hours before the time up to which it was to have continued.

It was generally agreed by all lay witnesses that the exercise had been of very great value to all concerned, particularly in the realm of inter-Service co-operation. The anti-aircraft searchlights, manned both by Regulars and Territorials, proved themselves almost unexpectedly efficient in picking up and holding the attacking bombers—though in this they were no doubt helped by the low cloud ceiling which prevented the attackers from flying high. The air raid precautions exercise, which was held under the ægis of the Home Office, at Portsmouth and Southampton, gained in realism from its coincidence with a simulated bombing attack by machines of the Fleet Air Arm.

SEPTEMBER EXERCISE.

The opportunity was taken early in September of the passage of the Home Fleet from its home ports to Scottish waters to exercise certain shore-based R.A.F. units in locating and attacking a force at sea. Of the Home Fleet, owing to the absence of ships on duty in Spanish waters, only the Rodney, Ramillies, Courageous and five destroyers were available. The R.A.F. units engaged were:

No. 209 (F.B.) Squadron from Felixstowe.
Nos. 210 and 228 (F.B.) Squadron from Hornsea Mere.
Nos. 206 and 217 (G.R.) Squadron from Bircham Newton.
No. 269 (G.R.) Squadron from Abbotsinch.
No. 233 (G.R.) Squadron from Thornaby.

The Courageous's bombers made various attacks on targets on the East Coast, and her fighters were used to protect the Fleet. The F.B. Squadrons were exercised in locating and shadowing the Fleet, while the G.R. Squadrons made bombing attacks on it. The exercise was a set piece, since it was the first time that some of the newly formed G.R. Squadrons had had an opportunity of exercise with men-of-war. Much valuable experience was gained.

LONG CRUISES BY R.A.F. UNITS.

The following extended cruises by shore-based squadrons of the R.A.F. were made during the year.

WEST AFRICAN CRUISE BY NO. 202 (G.R.) SQUADRON.

Two Scapa flying-boats of No. 202 (G.R.) Squadron left Malta on December 12, 1936, on a cruise to West Africa. Both aircraft visited Algiers, Gibraltar, La Luz, Port Etienne, and Bathurst on the outward flight, and arrived at Freetown on the 21st. One aircraft flew on to Lagos, where it arrived on Christmas Day, having spent the night of the 24th at Takoradi. It left Lagos on January 2, 1937, and joined up with the other aircraft at Freetown on January 4, having spent two nights at Abidjan. Both aircraft returned to Malta, arriving on January 23, the route used being the same as that for the outward flight, with the exceptions that Tangier was visited instead of Gibraltar, and, in addition, a visit was paid to Dakar.

IRAQ–SINGAPORE FLIGHT BY NO. 203 (G.R.) SQUADRON.

Four "Singapore III" flying-boats of No. 203 (G.R.) Squadron left Basrah on January 17, on a flight to Singapore, in order to take part in the Combined Operations Exercises there. Two aircraft arrived at their destination on January 23, and two a day later, the route used being *via* Ras-al-Khaimah, Karachi, Allahabad, Calcutta, and Mergui.

The four aircraft returned from Singapore during February, the same route being used as for the outward flights, but in addition, Penang, Rangoon and Jhansi were visited.

SINGAPORE–HONG KONG CRUISE BY NO. 230 (G.R.) SQUADRON.

Four "Singapore III" flying-boats of No. 230 (G.R.) Squadron accompanied by the Air Officer Commanding, Far East, left Singapore on March 8 for Hong Kong, in order to take part in the Combined Operations Exercise there. One aircraft arrived at its destination on March 9th, having visited Kam Ranh Bay, and the other three arrived on the 10th, the additional night having been spent at Tong Ho Island owing to bad weather.

The return flight commenced on March 29, and was made *via* North Borneo. Visits were paid to Manila, Sandakan, Kudat, and Kuching, the aircraft arriving back at Singapore on April 9.

TRANSPORT OF FOUR ARMY NURSES TO GIBRALTAR.

Four Army nurses were flown non-stop by two London aircraft of No. 201 (G.R.) Squadron from Calshot to Gibraltar on June 2, in order to give medical attention to sailors of the Deutschland who had been injured by the bombing of that ship by Spanish Government aeroplanes. The aircraft arrived back at Calshot on June 4, having spent a night at Lisbon en route.

TRANSFER OF NOS. 209 (G.R.) AND 210 (G.R.) SQUADRONS TO THE MEDITERRANEAN.

Five "Singapore III" flying-boats of No. 209 (G.R.) Squadron and five of No. 210 (G.R.) Squadron flew to the Mediterranean to take part in the Anti-piracy Patrol Scheme decided upon by the Nyon Agreement, and were based on Arzeu in Algeria.

Both Squadrons were withdrawn during December. No. 209 Squadron left Arzeu on the 13th and arrived at Felixstowe on the 17th, while No. 210 Squadron left Arzeu on the 15th and arrived at Pembroke Dock on the 18th.

All the flights were made *via* Berre (Marseilles) and Hourtin.

FLIGHT OF NO. 204 (G.R.) SQUADRON TO AUSTRALIA.

Five London aircraft of No. 204 (G.R.) Squadron left Mountbatten on December 2 for Australia, in order to take part in the Australian 150th Anniversary Celebrations. Four of the aircraft arrived at Singapore, one aircraft having forced landed in the Bay of Bengal. Another London from No. 201 (G.R.) Squadron left England on December 26 to replace this aircraft, and arrived at Singapore on January 8, 1938. The route has been *via* Berre, Malta, Alexandria, Dhibban, Bahrein, Ras-al-Khaimah, Karachi, Gwalior, Calcutta, Rangoon, and Penang. The two crews changed over at Akyab, and the complete squadron, with the five original crews, left Singapore on January 10, arriving at Port Darwin on the 16th. Visits were to be paid to most of the state capitals in Australia.

TRAINING CRUISES BY R.A.F. SQUADRONS TO THE MEDITERRANEAN, 1937.

Four Royal Air Force flying-boat squadrons paid short visits to the Mediterranean during the year. These were :—

(i) No. 201 (G.R.) Squadron—January 15 to January 27.
(ii) No. 210 (G.R.) Squadron—April 14 to April 30.
(iii) No. 209 (G.R.) Squadron—May 20 to June 3.
(iv) No. 204 (G.R.) Squadron—August 9 to August 30.

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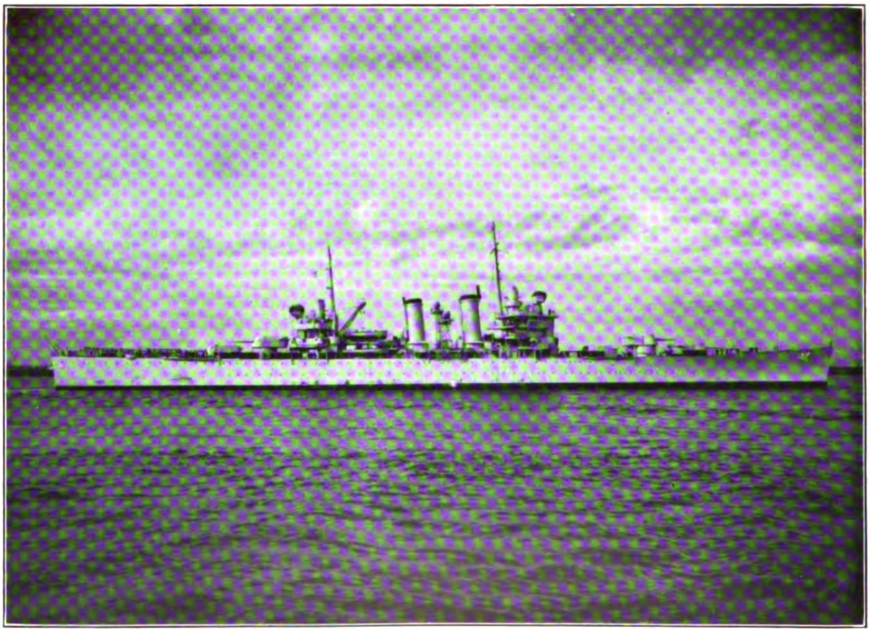
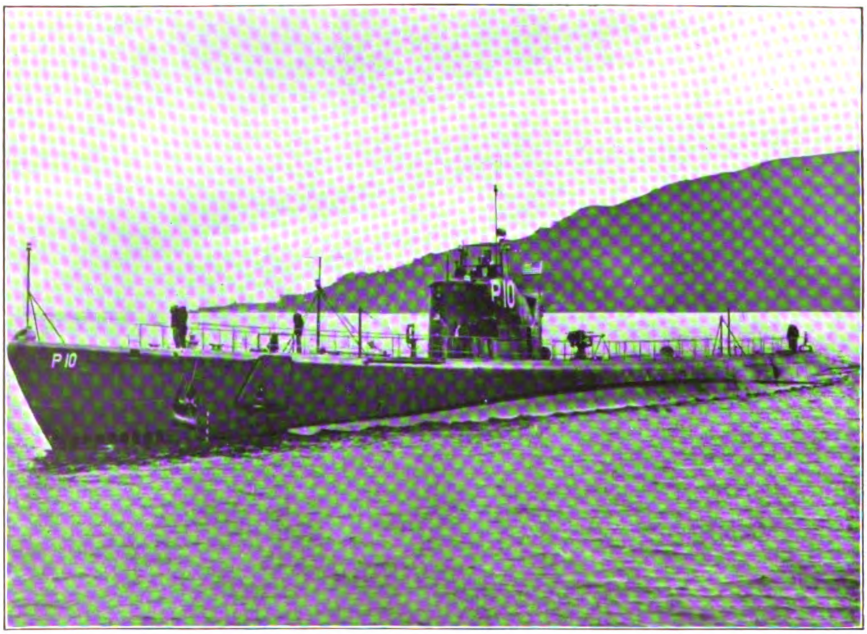




(TOP) THE UNITED STATES CRUISER PHILADELPHIA.

Completed 1937.

(BOTTOM) THE UNITED STATES SUBMARINE POMPANO.

Completed 1937.

(*Official U.S. Navy Photographs, by courtesy of Navy Department.*)

CHAPTER X.

FOREIGN FLEET AIR ARMS.

I.—GENERAL POLICY.

The year 1937 has been one of steady numerical increase among nearly all the foreign Naval Air Forces, but, apart from some signs of doubt concerning certain aspects of accepted policy, there has been no marked change in the normal lines of development.

CARRIER AIRCRAFT.

Except for a slight departure from past practice in the United States Navy, there has been no major development in this branch of the foreign Fleet Air Arms.

UNITED STATES.

The United States Navy continues to carry a variety of types in its two large carriers, Lexington and Saratoga. The complement (79 aircraft) of one of these carriers usually consists of as many as six different types—fighters, dive-bombers, scout-observation, scout-bombers, torpedo-bombers, and " Utility " aircraft. As was pointed out in the 1937 " Brassey," this diversity of types must complicate the operation of aircraft. For instance, aircraft of a certain type may be ranged on deck preparatory to flying off, when an unforeseen change in the situation may make it necessary to fly off aircraft of another type first. Apart from the delay in striking down the original aircraft and ranging the new type, the strain on the handling personnel can well be imagined.

It is possible that some such consideration has been responsible for a break from this policy in the case of the Ranger. This ship carries 57 aircraft, the number being made up by two squadrons of fighters, one squadron of scouting aircraft, and a unit of 3 " Utility " aircraft. It is presumed that these fighters can also carry out dive-bombing attacks and that the scouts are capable of carrying bombs.

The two new carriers Yorktown and Enterprise will carry a total of four squadrons of fighters, dive-bombers, scouts, and torpedo-bombers respectively.

JAPAN.

The complements of the Japanese aircraft carriers, the largest of which, the Kaga, carries some 60 aircraft, contain only two types, fighters and torpedo-bombers. The latter, however, are three-seaters which can also be used for reconnaissance.

Nothing is definitely known of the complement of the Soryu, the newest Japanese carrier, but, on a tonnage of 10,500 tons, the number of aircraft carried must exceed the Ryujo's 24 by a considerable margin. It is probable that she is equipped with three squadrons, 36 aircraft.

FRANCE.

The aircraft carrier Béarn carries three squadrons of 12 aircraft each. The squadrons are equipped with fighters, torpedo-bombers and "Surveillance," or short-range reconnaissance aircraft, respectively.

AIRCRAFT IN CAPITAL SHIPS AND CRUISERS.

Perhaps the most significant item of news under this heading is the announcement that the United States Navy is to set up a committee to determine future policy in regard to catapult aircraft. The Naval authorities appear to have been disturbed by the fact that the aircraft carried in capital ships and cruisers could be operated on only two days during the whole period of the 1937 manœuvres in the Pacific. Consequently, a committee, under the chairmanship of Rear-Admiral F. H. Sadler, has been ordered to report on the advisability of continuing the policy of carrying aircraft in battleships and cruisers. The alternative of building small carriers to accompany the battle and cruiser squadrons has been suggested.

In this connection it is interesting to note that the United States Navy has always crowded more aircraft into their fighting ships than any other foreign Navy has thought to be desirable. Now, having achieved one extreme, the United States is the first to consider the possibility of reversing the swing of the pendulum.

The disadvantages of carrying numbers of aircraft in fighting ships was fully explained in the 1937 issue of "Brassey." Owing to the landing and recovery limitations imposed by the state of the sea in the oceans, these aircraft must be considered as "one flight" aircraft, and must, therefore, be assessed at a very limited value. Furthermore, their hangars, catapults, and cranes take up space and tonnage which could be used to increase the fighting efficiency of the ship.

UNITED STATES.

It has been said above that the United States Navy has always been the chief exponent of the policy of carrying large numbers of aircraft in fighting ships. Perhaps the limit has been reached in cruisers of the "Brooklyn" class. This ship, which commissioned on September 30, 1937, is designed to carry no less than 8 aircraft in a hangar below her quarterdeck, where they are well protected against gun-blast and weather.

Other large cruisers in the U.S. Navy carry between 4 and 6 scouting aircraft, while most of the battleships are equipped with 3 observation aircraft, Pennsylvania and California carrying 4. One submarine, S1, is fitted to carry a small aircraft.

JAPAN.

Japanese ships generally do not carry as many aircraft as those of the United States Navy. Most of the larger cruisers are equipped with 3 reconnaissance aircraft, only a few carrying as many as 4. Capital ships operate 3 observation aircraft.

FRANCE AND GERMANY.

Both these Navies equip their cruisers and capital and armoured ships with 2 aircraft, whose functions are observation and reconnaissance. In the case of the new French battle-cruiser Dunkerque, it is probable that provision has been made for 4 aircraft.

ITALY.

Italian cruisers used to carry a small flying-boat, but their re-equipment with a single-float, two-seater seaplane has now probably been completed. The function of these aircraft is reconnaissance, and the numbers carried vary between 1 in the smaller cruisers to 4 in the large cruisers. One Italian submarine is fitted to carry a small seaplane.

SOVIET RUSSIA.

Most of the battleships and cruisers of the Soviet Navy carry 1 floatplane or small flying-boat, but some of the cruisers are equipped with 2. This Navy is believed to be the only one which has equipped destroyers to operate a small seaplane from a catapult, five Russian destroyers being so fitted.

SWEDEN.

The Swedish Navy has a cruiser, the Gotland, which can be said to have been designed primarily to carry seaplanes. Her normal equipment consists of 8 seaplanes, though she is capable of operating 11.

OTHER NAVIES.

The Navies of the Netherlands and Portugal also contain one or two ships which carry aircraft.

SHORE-BASED NAVAL AIRCRAFT.

The three major foreign Naval Powers have always had a force of shore-based aircraft specially equipped and trained to carry out certain naval functions. The United States Navy has the largest number of these shore-based aircraft, the Imperial Japanese Navy following closely.

Air forces, though possessing great tactical mobility, are notoriously immobile strategically, unless they have available for their use a vast number of specially prepared bases throughout the world. To provide strategic mobility by this means is impracticable by reason of the enormous expense involved, and is, indeed, impossible for those countries who do not possess the necessary territory. All navies which control shore-based naval aircraft have endeavoured, therefore, to increase the mobility of these forces by the provision of sea-going tenders, but, even so, it is natural that the lines of development of this side of naval aviation should differ widely in each country, and should follow closely the requirements imposed by the geographical situation in each case.

UNITED STATES.

The shore-based air squadrons of the United States Navy are composed mostly of large patrol-bomber flying boats with a great endurance. Clearly, this policy is based on the need to patrol the vast strategical triangle in the Pacific between the bases of Hawaii, the Aleutian Islands, and in the Canal Zone. The distances are large, and anything smaller than these huge flying-boats would not meet the requirements of this particular geographical situation.

That the Navy attaches great importance to these patrol squadrons and has a high opinion of their capabilities is shown by the decision, announced in the autumn of 1937, that they were to be transferred from the Base Force (local defence force) to the Scouting Force of the Fleet. As a consequence, the destroyers of the Scouting Force have been released to augment those of the Battle Force.

In addition to the ocean patrol squadrons, the U.S. Navy possesses local defence squadrons of land aircraft and seaplanes for coastal reconnaissance and torpedo and bomb attack. These aircraft are attached to the Base Force.

JAPAN.

The Japanese naval shore-based air force is in a position different from that of the United States. The large number of Japanese islands, which cover the area of greatest strategical importance to Japan, enable bases to be established in the most suitable places with comparatively short intervening distances. The Japanese Navy, therefore, equip their shore-based squadrons with medium-range flying-boats, seaplanes for coastal reconnaissance, and land aircraft for torpedo and bomb attacks and fighting.

FRANCE.

The French Navy's shore-based aircraft are designed mainly for duty round the coasts of France and the African colonies. Nearly half the force consists of land aircraft of bomber type. The other half is composed of flying-boat squadrons for reconnaissance. These flying-boats are of two types, the "Exploration" (long-range) and the "Surveillance" (short-range). In addition the Navy possesses some 30 land fighters within its shore-based air force.

ITALY.

The naval co-operation squadrons of the Regia Aeronautica, which are attached to the naval coastal commands, consist almost entirely of flying-boats or large seaplanes of the medium-range type. Their duties are primarily reconnaissance, though they can be used in an offensive role. They could only be usefully employed, however, in attacks on very weakly defended targets, and Italy must rely mainly on the bomber squadrons of her metropolitan air force for offensive action against sea-borne forces.

GERMANY.

It is difficult to decide what policy Germany is following in regard to shore-based naval aircraft. It is, indeed, possible that no definite line of policy has yet been adopted. The VIth Area contains the naval wing of the German Air Force, and it possesses a few miscellaneous squadrons of seaplanes and torpedo-bomber landplanes, but its main function seems to be to supply the catapult aircraft whenever they are required by the ships of the Navy.

SPAIN.

It is clear from reports of air attacks on shipping in the Mediterranean that the Spanish Insurgent Navy controls a number of flying-boats and seaplanes. From the descriptions given by seamen, they would appear to be of the Cant and Heinkel types.

HOLLAND.

The Netherlands Navy is developing a shore-based air service, both at home and in the Dutch East Indies. The force will consist of a number of flying-boats and large seaplanes.

OTHER NAVIES.

The Soviet, Swedish, and Portuguese Navies are provided with a certain number of co-operating aircraft. The Soviet shore-based naval co-operation units probably consist largely of flying-boats.

SEAPLANE CARRIERS AND TENDERS.

The development of this type of vessel is confined solely to those foreign navies who possess a properly constituted naval shore-based air service, and is, in effect, an attempt to increase the strategic mobility of their flying-boat and seaplane squadrons.

UNITED STATES.

The Langley, lately an aircraft carrier, has now been converted into a tender for the patrol squadrons of the Scouting Force. These squadrons also have the tenders Wright, Thrush, and Owl.

The Base Force aircraft, the greater proportion of which are Fleet Marine Force landplanes, will have only one tender, the Rigel. This ship will act as the mobile base of the two squadrons of "Utility" aircraft attached to the Base Force.

JAPAN.

The Japanese Navy has had two seaplane carriers, the Notoro and the Kamoi, in commission for some time. Each can transport some 8 to 10 seaplanes. The 10,000 ton tender Chitose was launched in November, 1936, and is probably now in commission. Two smaller tenders, the Chiyoda and Mizuko, were laid down at the end of 1936.

FRANCE.

The French Navy, whose main sphere of operations is in the Mediterranean and round the Atlantic seaboard, is not so dependent on tenders to provide its shore-based aircraft with mobility as are the Navies of the United States and Japan. Consequently, the French possess only one ship of this type, the Commandant Teste, which carries some 26 seaplanes of the torpedo-bomber and short-range reconnaissance types.

ITALY.

The area in which the Royal Italian Navy is most likely to operate is not large and is well supplied with aircraft bases. For this reason, seaplane tenders are not a necessary part of the shore-based naval aircraft squadrons, and it is believed that the seaplane carrier Miraglia is now used solely for the purpose of transporting aircraft and aircraft stores from Italy to the outlying colonial bases.

II.—ORGANISATION IN DETAIL.

UNITED STATES.

POLICY AND ORGANISATION.

Rear-Admiral A. B. Cook, Chief of the Bureau of Aeronautics, announced that the present policy called for 2,000 naval aircraft by 1941. The first-line strength will then consist of 68 squadrons, 39 of which will be ship-borne. The remainder will be made up of 6 landplane squadrons of the Fleet Marine Force and 23 squadrons of patrol flying-boats and "Utility" amphibians. The figure of 2,000 aircraft probably includes reserves, because, calculating 68 squadrons on the basis of the normal first-line strength, the figure reached is 1,086 aircraft.

It was also announced in October that the Navy possessed some 1,100 aircraft at that time, with a further 800 on order. With deliveries reported at 50 per month, the original "Treaty Navy Programme," which called for 1,910 aircraft by 1939, will be completed in the first month of that year. These figures must also include reserves, since the present first-line strength amounts to some 758 aircraft distributed as follows :—

Ship-borne—452.
Shore-based patrol and utility squadrons—198.
Fleet Marine Force—108.

PERSONNEL.

Rear-Admiral A. B. Cook, U.S.N., continues as Chief of the Bureau of Aeronautics. Other important commands in the Naval Air Service are held by the following :—

Rear-Admiral F. J. Horne, U.S.N.—Aircraft, Battle Force.
Rear-Admiral E. J. King, U.S.N.—Aircraft, Scouting Force.
Commander A. J. Price, U.S.N.—Utility Wing, Base Force.

Rear-Admiral King was, until very recently, in command of the Aircraft, Base Force.

The Aviation Cadet scheme, which was described in the 1937 issue of "Brassey," is apparently progressing satisfactorily. The first batch of the 1937–38 fiscal year arrived at the Naval Air Station at Pensacola in July. This class of 74 Cadets had previously carried out their preliminary training at the Naval Reserve Aviation Bases. After a period at Pensacola, the Cadets go to sea for three years, being granted a commission and a gratuity on retirement to the Reserve. It is intended to enter 450 cadets during the 1937–1938 fiscal year, of which some 315 are expected to pass into service.

AIRCRAFT CARRIERS.

The main event of 1937 was the commissioning of the new 20,000-ton carrier Yorktown. This ship was due to complete in May, but, owing to unsatisfactory trials, was delayed until the end of September. It is understood that her sister ship, the Enterprise, originally due to commission in September, will be delayed for a similar time. Both these ships will carry four squadrons, a total of 72 aircraft.

An interesting feature of these two ships is the provision of a catapult on each side, level with the hangar deck. This will enable aircraft to be catapulted direct from the hangar, without the delay caused by raising them to the flight deck.

During 1938, when both the Yorktown and Enterprise have joined the Fleet, the Battle Force carrier divisions will be reorganised as follows:—

Division 1—Saratoga, Lexington.
Division 2—Yorktown, Enterprise, Ranger.

The 14,500-ton aircraft carrier Wasp, which was laid down in April, 1936, is expected to complete in September, 1938.

SERVICE AIRCRAFT.

The Navy has recently purchased a number of Sikorsky two-engined amphibian monoplanes. These aircraft, which have 800 h.p. Hornet engines, are capable of carrying a load of some 2 tons over a long distance at a cruising speed of 150 knots. Though intended primarily as utility aircraft, they can be adapted to carry out the duties of patrol-bomber.

An order has also been placed for several Grumman single-engined amphibians for Utility duties. This type of aircraft is a three-seater with a Wright "Cyclone" engine and is designated the J2F-1.

A new flying-boat, built by Sikorsky and designated XPBS-1, has been undergoing trials. It is designed as a patrol-bomber, and is fitted with four Pratt and Whitney engines of 1,050 h.p. each. It is larger and better equipped than the present patrol-bomber, the PBY1, and is said to have the same long range.

A Seversky fighter-dive-bomber carried out tests in June, 1937, but the result of the tests and the details of aircraft remain unknown.

The following aircraft are now in service :—

SHIP-PLANES.

Fighters—Grumman F3F1 and F2F1 ; Curtiss BF2C.
Scout-bombers—Curtiss SBC3 ; Vought SBU1.
Torpedo-bombers—Douglas TBD1 ; Great Lakes TG2 and BG1.

SEAPLANES.

Scout-observation—Curtiss SOC1 ; Vought OU3.
Patrol-bombers—Consolidated PYB1 and P2Y2.

LIGHTER-THAN-AIR CRAFT.

The House Committee on Naval Affairs has had before it a proposal to continue the construction of large rigid airships. The proposal, which was sponsored by Rear-Admiral Cook and Commander E. Rosendahl, an officer with considerable airship experience, was opposed by the Chief of Naval Operations, Rear-Admiral William D. Leahy.

Admiral Cook's arguments were novel and are worth repeating. He pleaded the value of large airships as aircraft carriers, and stated that plans had already been prepared for an airship of 10,000,000 cubic feet capacity, which could carry 9 bombers weighing, with their load, 10,000 pounds each. This ship would be able to cruise at a speed of 70 m.p.h. for a distance of 15,000 miles, which is the same range as that possessed by a surface aircraft carrier. He claimed that seven of these airships could be built for the same cost as one surface carrier, and that they were no more vulnerable to attack.

BASES.

A new Fleet Air Base is to be constructed at Alameda, in San Francisco Bay, to relieve the congestion at San Diego consequent upon the commissioning of the two new carriers Yorktown and Enterprise. Although over $14,000,000 has been appropriated for this work, it is understood that progress has been delayed by some hitch in the title of the land.

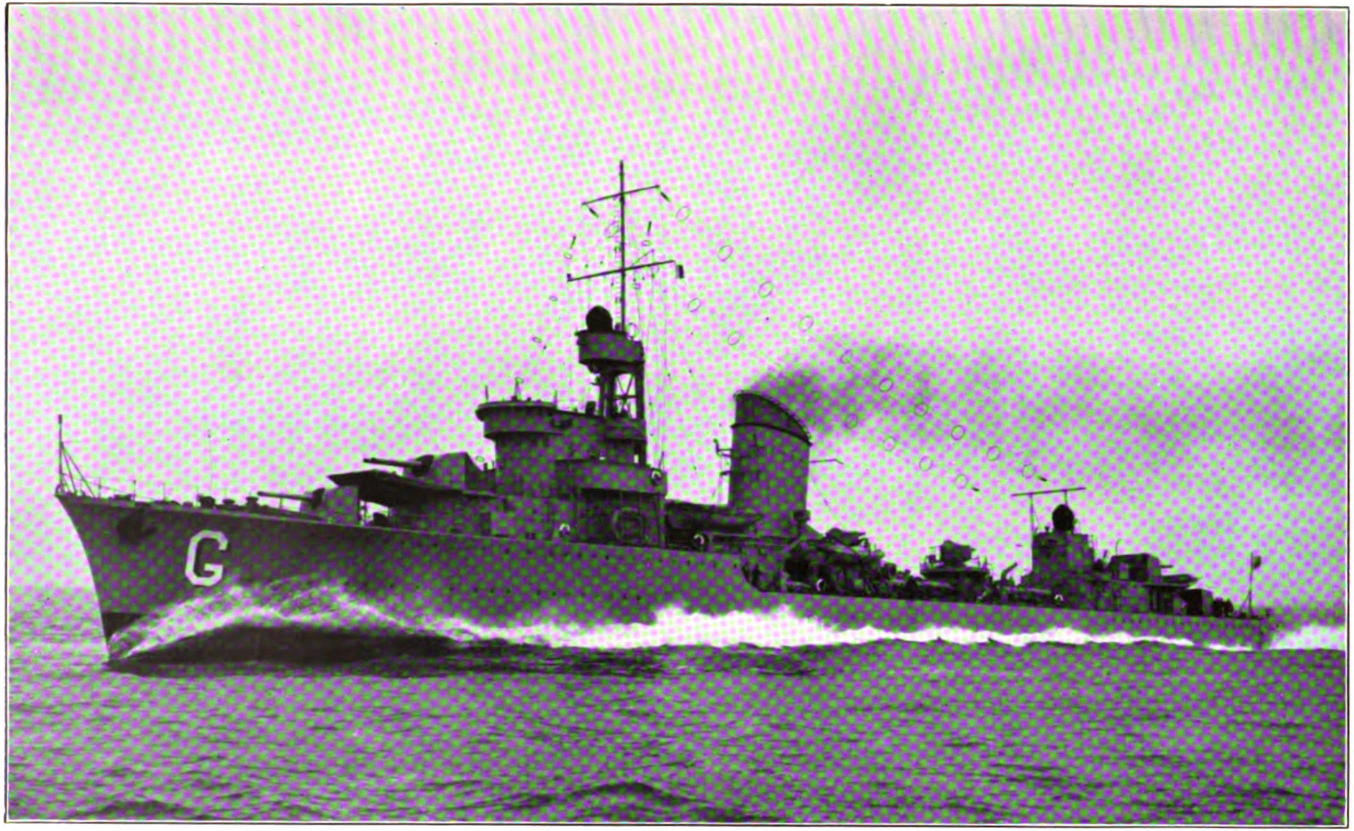
JAPAN.

POLICY AND ORGANISATION.

The Replenishment Plans, which have been announced in past years, provide for a first-line strength of 392 ship-borne and 472 shore-based aircraft, exclusive of reserves, in 1938. The 1937–1938 estimates provide for a further expansion of eleven squadrons.

At present, if all ship-borne units are at full strength and assuming 36 aircraft in the Soryu, the ship-borne first-line strength is about 302 aircraft. The first-line strength of the shore-based naval air service must now have reached a figure of approximately 450 aircraft.

These figures do not take into account any reserve squadrons, which may have been formed during the Sino-Japanese conflict ; nor is any allowance made for casualties.



THE POLISH DESTROYER GROM.

Completed 1937.

(By courtesy of the builders, Messrs. J. S. White and Co., Ltd., Cowes.)

PERSONNEL.

The scheme of entering "Flying Cadets," which has been described in previous issues of "Brassey" was introduced to cope with the expansion of the Fleet Air Arm and is similar to the American "Aviation Cadet" scheme. The Japanese Cadets do their first two years at a training school and then go to sea. Later they may be promoted "Air Warrant Officer," and, in certain cases, may reach the rank of Lieutenant-Commander or Commander. The Japanese Press announce that 130 of these Cadets were enlisted during 1937.

AIRCRAFT CARRIERS.

The 10,500 ton aircraft carrier Soryu, which was launched in December, 1936, is presumed to be in commission. Her sister ship Hiryu was launched at Yokusuka in November, 1937.

The 10,000 ton seaplane carrier Chitose, launched in November, 1936, at Kure, is assumed to be in service.

SERVICE AIRCRAFT.

Three new types of aircraft have recently made their appearance in the Japanese Fleet Air Arm. They are :—

Type 95 Ship-plane fighter. Top speed, 180 knots.
Type 94 Float-plane 3-seater. Top speed, 150 knots.
Type 91 Flying boat. Top speed, 125 knots, with an endurance of about 24 hours.

Other aircraft still in service are :—

SHIP-PLANES.

Type 90 Fighters. Top speed, 160 knots. Endurance, 6½ hours.
Type 89 Torpedo-bombers. Top speed, 115 knots. Endurance, 3 hours.
Type 92 Torpedo-bombers. Top speed, 120 knots. Endurance, 4½ hours.

SEAPLANES.

Type 90–2 Reconnaissance Float-plane. Top speed, 145 knots. Endurance 6½ hours.
Type 90–2 Flying-boat. Top speed, 120 knots. Endurance, 14 hours.

FRANCE.

ORGANISATION AND POLICY.

The organisation of the Aéronautique Maritime was fully explained in the last year's "Brassey." It is divided into two sections, the Aéronautique Navale (the Fleet Air Arm proper), which is manned, operated, and administered by the Navy, and which includes both ship-borne and shore-based aircraft, and the Aéronautique de Coopération Maritime, which is a section of the Armée de l'Air and is under the Air Minister.

M. Renaitour, the President of the Chamber Naval Commission, told the Press that the Naval Air Arm was to be increased during 1937 by four squadrons. Whether this increase has, in fact, been achieved is open to doubt. Assuming that it has, the first line strength of the Aéronautique Navale would be 278 aircraft, of which some 70 are ship-borne.

PERSONNEL.

M. Renaitour also stated that the personnel of the Aéronautique Navale would be increased by 4,000 men during 1937.

SERVICE AIRCRAFT.

The French Navy has recently bought 3 " Autogiro " gyroplanes for observation and anti-submarine purposes.

There is a variety of aircraft in the Fleet Air Arm, some of the more numerous being described below.

Brèguet " Bizerte " long-reconnaissance flying-boat. Top speed, 120 knots. Endurance, 11 hours.
C.A.M.S.37 short-reconnaissance flying-boat. Top-speed, 110 knots. Endurance, 6 hours.
C.A.M.S.55 long-reconnaissance flying-boat. Top speed, 110 knots.
Latècoère 302 and 381 long-reconnaissance flying-boats. Top speed, 115 knots. Endurance, 15 hours.

GERMANY.

POLICY AND ORGANISATION.

The VIth Area of the German Air Force is the Naval Wing and supplies all the aircraft required by catapult ships. In addition, it contains a few shore-based squadrons of flying-boats, seaplanes, and land aircraft, all of which are employed on coastal naval co-operation duties. The administration and operation of these units are under the control of the Air Ministry, except that, when aircraft are embarked, the operational command is vested in the Naval Commander.

PERSONNEL.

When the VIth Area was originally constituted in 1933, all the officers, including the Commander, General Sander, had previously served in the Navy. This system of recruiting the officer personnel of the Naval Wing from the Navy proper is probably still in force. All the officers so transferred wear Air Force uniform.

AIRCRAFT CARRIERS.

The 1936 programme provided for two 19,250-ton aircraft carriers, one of which was laid down in 1936. The aircraft complement of these carriers has been variously reported as between 25 and 50 aircraft, but, on the tonnage, the higher figure is the more probable. They are reported to be designed for 30 knots and to be armed with a number of 5·9 inch guns.

SERVICE AIRCRAFT.

A new type twin-float seaplane, built by Arado, has appeared in the VIth Area. It is fitted to carry bombs or a torpedo and has a reported top speed of 170 knots. As it is stressed for catapulting and has folding wings, it may be intended to replace the Heinkel He 60 as the catapult aircraft in ships.

Other aircraft in the Naval Wing are :—

Heinkel 60 two-seater reconnaissance float-plane. Top speed, 140 knots. Endurance, 5 hours.
Heinkel 51 single-seater fighter. Top speed, 190 knots. Endurance, 2 hours.
Junkers 52 reconnaissance landplane, also used for bombing.

BASES.

The main base of the VIth Area is a combined aerodrome and seaplane station at Holtenau, Kiel.

ITALY.

POLICY AND ORGANISATION.

There appears to be no intention of increasing the number of the naval co-operation squadrons of the Regia Aeronautica, but, despite other unexpected commitments, it is probable that the rearmament of these squadrons has now been completed. The first-line strength of the naval co-operation force remains at about 216 aircraft, of which 126 are primarily for reconnaissance, the remainder being bombers.

In addition there are some 30 aircraft embarked in ships.

An interesting description of the functions of the Naval co-operation squadrons was given in the Report on the Naval Air Arm, which accompanied the naval estimates. After pointing out the co-operation achieved by naval and air forces at naval bases, the report stressed the necessity of stationing specially constituted squadrons of torpedo-bombers at these bases in addition to the ordinary air force squadrons. It emphasised the pre-eminently naval role of such aircraft and stated that their functions were analogous to those of surface torpedo craft.

SERVICE AIRCRAFT.

The reconnaissance aircraft attached to the sea commands are Cant Z501 flying-boats, which have a top speed of 140 knots and endurance of 11 hours. The bombers are mostly Savoia twin-hulled flying boats.

The aircraft embarked in ships are Romeo Ro 43 single-float, two-seater reconnaissance seaplanes with a top speed of 170 knots.

PORTUGAL.

The Portuguese Naval Air Service was the subject of a Government Decree at the end of 1936. The operational command is vested in the General Staff of the Navy, the administration, equipment and training being the responsibility of the Directorate of Naval Aviation. Its functions were defined as :—

(*a*) Protection of maritime communications.
(*b*) Protection and defence, in collaboration with military air forces, of coasts and naval bases.
(*c*) Co-operation with the Naval coastal defence and anti-aircraft artillery.

(*d*) Co-operation with the Army and Navy in circumstances in which the theatre of operations makes it preferable to employ naval aircraft.

The Decree went on to lay down that the squadron (6 to 12 single-engined aircraft or 3 to 5 multi-engined aircraft) was to be the fundamental unit.

PERSONNEL.

The Decree mentioned above also described the personnel of the Naval Air Service.

(*a*) Naval Officers as pilot-observers.
(*b*) Naval Engineers as aviation engineers.
(*c*) Aviation mechanics, who may also be pilots, to carry out the duties of gunner, telegraphist, and bomb aimer.

SERVICE AIRCRAFT.

The Naval Air Service possesses some 6 Blackburn "Shark" Torpedo-Bomber Reconnaissance seaplanes, a few Hawker "Osprey" fighter reconnaissance seaplanes, about 12 Junkers seaplanes, and a few training seaplanes.

HOLLAND.

POLICY AND ORGANISATION.

The Dutch Naval Air Service in the Netherlands and the Dutch East Indies consists of some 62 first-line aircraft. Included in this number are 12 of the 1936 order for 18 large sea-scouting flying-boats. Another 18 of these Dornier flying-boats were ordered during 1937, while the expansion programme provides for a further 24 to be built in Holland.

BASES.

The Naval Air Bases in the Netherlands are at Helder, Texel, and Vere (Zeeland). The Bases in the Dutch East Indies are at Sourabaya and at Tandjong Priok, near Batavia.

SWEDEN.

A few squadrons of the Air Force are allocated to Naval co-operation duties, and are placed under the Naval Commander-in-Chief when they are actually engaged in those duties. The aircraft in these units are Hawker "Osprey" reconnaissance and Heinkel aircraft.

SOVIET RUSSIA.

One Air Brigade is allotted to each of the three Naval Commands in the Baltic, Black Sea, and Far East respectively. Each brigade has a first-line strength of about 100 aircraft. The brigades attached to the Baltic and Black Sea Commands are made up of squadrons of fighters, bombers, and reconnaissance flying-boats. In the Far East, however, it is thought that the brigade consists solely of reconnaissance flying-boats.

DENMARK.

The Danish Naval Air Service, which has bases at Copenhagen and Ringsted, is equipped with the following aircraft :—

Heinkel three-seater seaplane for reconnaissance.
Hawker " Horsley " torpedo-bomber seaplanes.
Hawker " Nimrod " single-seater fighter landplanes.

SPAIN.

The civil war in Spain has continued throughout the year, and in consequence information concerning the Naval air forces of either side is practically non-existent.

CHILE.

The Naval Wing of the Chilian Air Force has bases at Valparaiso, Puerto Montt, and Magellanes. The equipment includes Fairey 111F seaplanes and Dornier " Wal " flying-boats for reconnaissance and Sikorsky amphibians.

BRAZIL.

The Naval Air Service is equipped with Boeing and Curtiss fighters, and Vought " Corsair," Curtiss " Falcon," and Fairey " Gordon " aircraft for reconnaissance.

"VIGILANCE."

CHAPTER XI.

NAVAL AIRCRAFT PRODUCTION.

CHARACTERISTICS OF NAVAL AIRCRAFT.

Aircraft designed specifically for service with the Fleet Air Arm are only just beginning to come into service. For the first time the list includes a bomber. Up to 1937 there were several types, like the torpedo-spotter reconnaissance class, which might carry bombs at need instead of the more customary torpedoes, but the Navy had placed little reliance in bombing as such until certain tests were made with bomber aircraft against wirelessly controlled vessels and until several sets of exercises in the last four years had revealed the offensive possibilities of bombing and particularly of dive bombing. With the production of the Blackburn Skua, dive bombing was officially added to the tactical training of the Fleet Air Arm; and with it came a new standard in performance and a whole set of new problems for mutual solution between the design staffs of Admiralty and Air Ministry and the aircraft constructors who must satisfy the specialist needs of the Fleet Air Arm.

For the first time speed becomes a matter of importance to the naval air arm, just as it has long been vital to the general air service. It is significant that no type of aeroplane in the service of the Fleet Air Arm is capable of a speed of 200 miles an hour. The torpedo bombers may deliver their assaults after diving gently to surface level at something approaching that speed, but they will have made the approach at a speed of about 130 miles an hour and they will make their escape at the end of the attack at something less than that speed while they climb to safer heights. Even the Fleet fighters at their best can boast no more than 181 miles an hour, and the reconnaissance aircraft—which, as represented by the Walrus, might more properly be called communications aircraft—can count on only 135 miles an hour. Just what speed the Skua may do has not yet been released for publication, but its modern design and powerful engine promise something well over 200 miles an hour with a big load of bombs.

The range of the Navy's aircraft is thus beginning to widen itself greatly. It is being extended, indeed, at both ends of the scale. To maintain the balance the Navy is equipping itself with a new type of light reconnaissance float seaplane, the Fairey Seafox, which is economical, seaworthy, and capable of carrying a relatively big load, but has only moderate performance. Both these types have evidently been designed for operation from shipboard, and the

Skua low-wing monoplane may be regarded as bearing the burden of the transition difficulties. It is the first low-wing monoplane to be built or adapted for naval purposes. It represents the application of all the modern devices—such as flaps on the trailing edge, retractable undercarriage with all the hydraulic attachments, and high stressing for the large terminal velocities required in dive bombing—to those special needs of the Navy which include wing-folding, imposed by the limited accommodation of the aircraft carrier. The Seafox, on the other hand, represents the determination to supply to the fighting ships aeroplanes which may not occupy too much space and yet may be strong enough for catapulting and good enough on the water to come safely down in fairly bad weather and to get alongside for hoisting aboard.

These two types conform strictly to the rule which has persisted in the last twenty years, that all naval aircraft should be shipborne. The Fleet Air Arm during that period has had its land stations for training and for the accommodation of Fleet units during their periods in port. Aircraft have been used from these bases in exercises to operate over the sea against " enemy " naval vessels, and realisation that there is a valuable use for land-based aircraft in naval operations has grown with every improvement in range and with the growing skill of pilots and navigators in the navigation of aircraft over the sea. The position is being advanced likewise by the development of wireless aids to navigation. With the new fast aircraft, range has increased to about 1,000 miles, allowing a safe radius of action of about 400 miles and offering the Navy a good opportunity to add land-based forces to its strength in shipborne aircraft. The duties of such aircraft might fall generally into the same categories as those of aeroplanes carried in aircraft carriers and cruisers. Reconnaissance appears to come first in importance, with bombing or torpedo dropping in the second place. A shore-based fighter force is less likely to be needed in naval operations, because the duration and range of the fast fighters is too limited to allow of long journeys over the sea in search of the quarry.

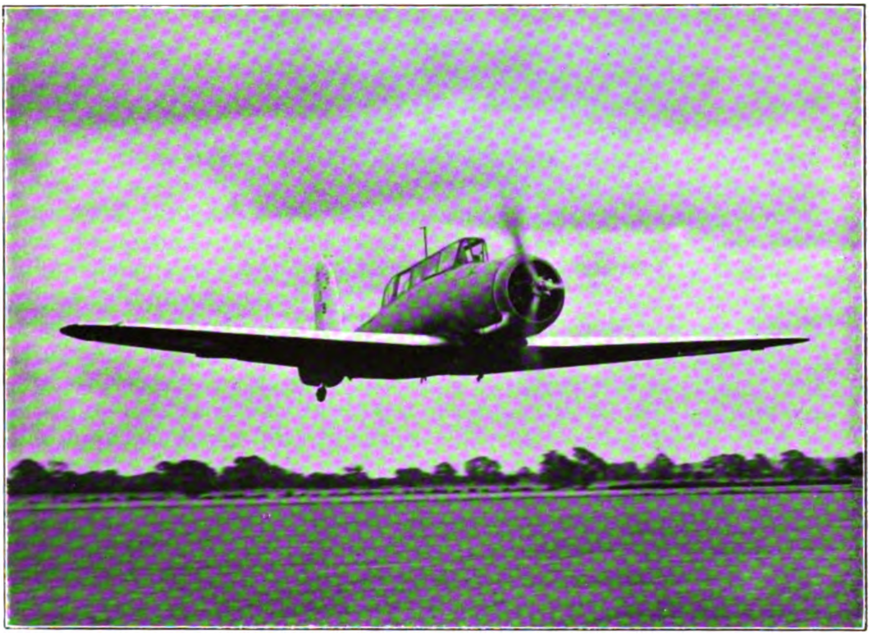
Whether shore-based or shipborne, the naval aeroplane makes special demands. It might theoretically be best to use only seaplanes or amphibians. The Supermarine Walrus indicates a tendency in the direction of the amphibian which may use its wheels for a deck landing or its hull for alighting on the water. There are likewise float seaplanes for the catapult ships, and although the Navy has never had flying-boats at its disposal, two general reconnaissance squadrons equipped with flying-boats were detached from the R.A.F. in 1937 to serve with the Fleet in the Mediterranean on anti-submarine patrol work. In fact, the vast majority of the 250 aircraft which now constitute the first-line strength of the Fleet Air Arm are land machines in the sense that they have wheel undercarriages. Some of them resemble land aircraft which are in regular use in R.A.F. squadrons. The Nimrod is a naval version of the Hawker Fury and the Osprey is derived from the Hart, just as the Fairey Seal is the Gordon in naval form. But so much modification was required in fitting these aircraft for their work in the

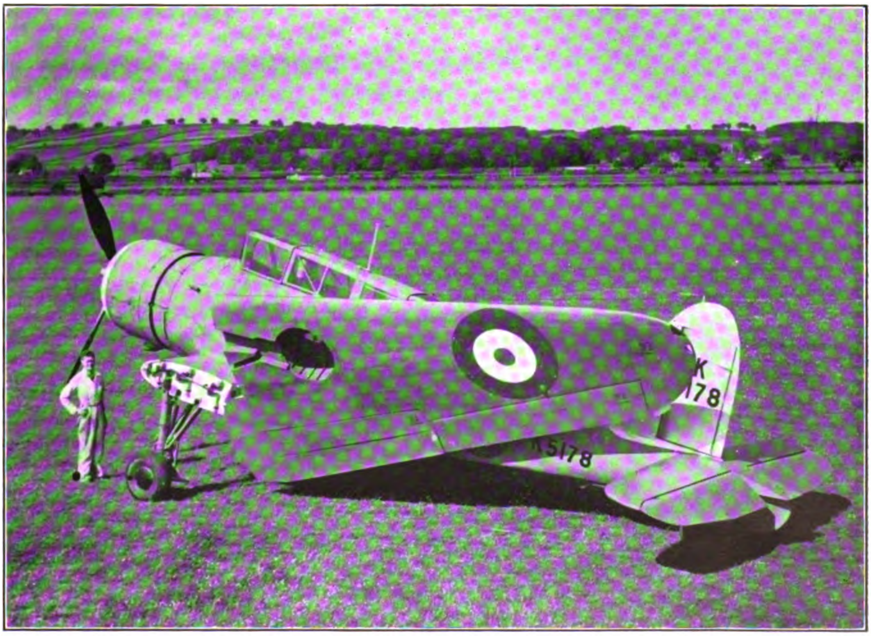
Fleet Air Arm that they virtually deserved the different names which distinguished them.

In the early days of adaptation it was customary, for instance, to supply land aircraft on marine duties with flotation gear—an arrangement of pneumatic buoys which might be inflated from bottles of compressed air in the event of a forced descent and could be trusted to keep the aeroplane afloat for many hours. That form of improvisation is now passing away and the marine aeroplane is being made buoyant by means of a number of water-tight compartments within those parts of the fuselage which are not broken by the cockpits. This method has become much easier of accomplishment by the adoption of the monocoque type of construction, in which the thin metal covering of the fuselage lends itself to the creation of a series of air-filled cells all self-contained, so that damage to one part of the fuselage may not involve the flooding of all of them. The strength factors of such aircraft have also to be raised to allow both for heavy landings in the difficult conditions which sometimes obtain in reaching the decks of aircraft carriers and for the high accelerations of catapulting, in which speeds may rise from nothing to 50 miles an hour in the short run of about 40 feet and in the brief space of about three seconds.

Here are involved weight considerations which are always of great importance in aircraft. It is significant that naval aircraft adapted from successful landplane types have never given quite the same performance. Top speeds and cruising speeds are generally reduced by the need to allow slightly lower wing-loadings so that alighting speeds may not be too high. The average wing-loading among Fleet Air Arm types is well below 15 lb. to the square foot, whereas there are several types of land aircraft with wing-loadings up to 22 lb. to the square foot, and there is the example of a commercial seaplane in the Short Empire flying-boat which has a wing-loading of 27 lb. to the square foot. The strict limitation in the Fleet Air Arm is evidently about to be broken in the Skua, which is based on the modern plan of high wing-loading associated with trailing edge flaps. Upon its success may largely depend the future policy of the Fleet Air Arm in respect of shipborne aircraft. Subject to the ability to raise wing-loadings the price which has to be paid in naval craft for higher strength factors may tend to become less important.

In the matter of equipment the naval aeroplane is again a specialist product. Its tasks are roughly those of the equivalent types of military aeroplane. It has to reconnoitre and report, it has to bomb and torpedo, it has on occasion to fight enemy bombers and beat off enemy fighters. These generalisations need modification in the sense that its objectives are usually smaller than those of the military aeroplane and that the main opposition, whether from fighter aircraft or anti-aircraft artillery, is to be anticipated only in the neighbourhood of the objectives. The main important difference rests in the fact that journeys must be made almost entirely over the sea. There can be no question of navigating by landmarks or of obtaining vital information concerning the strength





THE BLACKBURN "SKUA" DIVE-BOMBER-FIGHTER.

(Top) In Flight.
(Bottom) With Wings folded.

(Photos by courtesy of Blackburn Aircraft, Ltd., and " The Aeroplane.")

and direction of the wind by observing indications on the surface of the earth. Furthermore, the naval aircraft often has to seek its base at a different point on the sea from that at which it left it. Navigation and communication thus become of first importance.

In these circumstances, any temptation to employ the single-seat type of aeroplane, in order to obtain the high performance which its small dimensions may confer, is discouraged by the need to secure a high standard in navigation. The second occupant in any naval aeroplane is most desirable, because the officer who flies the aeroplane may find some difficulty in taking astronomical sights and working out position lines on a chart while he is engaged in controlling his machine and keeping a look-out for enemy vessels or aircraft. A place must be found, therefore, for a navigator and conditions must be provided in which the science of navigation can be practised with some convenience and accuracy. In this respect the general reconnaissance squadrons of the R.A.F. are similarly situated. Their duty is primarily that of coast defence, but it involves long journeys over the sea; and the use of flying-boat squadrons with the Navy in the Mediterranean has shown how fine may be the dividing line between the duties of the two Services. As in the Fleet Air Arm, the general reconnaissance squadrons may be equipped with either landplanes or seaplanes. No matter which is used, special facilities are provided for the navigator. An attempt is made to give him a steady platform for the taking of sights with the bubble sextant, and a chart table occupies a convenient place in the cabin.

Similarly, in the matter of wireless, it is useless for reconnaissance aircraft to go out on duty if they are unable to report what they find; it is also wasteful to allow naval aircraft to leave their mobile homes unless they can be informed by wireless of the movements of the ships to which they belong and can be given directional assistance, if necessary, in finding their way back to them.

PROCEDURE OF PRODUCTION.

In these respects, particularly, the naval aeroplane demands individual attention and, now that aircraft are being designed specially for the Navy, the method of issuing specifications based essentially on naval requirements is being followed. In the R.A.F. this custom of defining the characteristics of one or other type of replacement machine has been long practised, and the constructors have had so much experience in working to specifications that it has been found possible to diminish greatly the lag between the issue of specifications and full production of the chosen type. In naval affairs some firms have specialised long enough to be able to offer similar service, as may be seen in the production of the Skua, but it is likely that the older method of specification, official tests, Service trials, and production order will have to be followed for a time in order to secure for the Navy aircraft which will fully meet its special requirements.

What happens under this system is that the Admiralty, in association with the Air Ministry, draws up the specifications stating the type of aircraft, the performance required, the load capacity, the defensive armament, the type and nature of accommodation, and the special items of equipment for which places must be found. The aircraft constructors are then at liberty to submit designs in competition, and from these a selection of two or three is made. Specimen aircraft are then ordered and are submitted to tests at the Royal Aircraft and Armament Establishments, and on the strength of these tests modifications are suggested and a final choice of one type is made. An order for sufficient aircraft of that type to equip a squadron is then placed and these aircraft are subjected to a year of hard work. At the end of that time the type has either proved itself beyond doubt or has revealed some characteristic which makes it undesirable to take larger numbers into the Service. If the report is good, then large quantities begin to flow into the units and the aircraft may remain a standard type for a period of five or six years. There are certain aircraft in the Fleet Air Arm to-day which have run their full term of obsolescence. The time for large-scale replacement with modern types should be quite close.

So far, only seven aircraft firms have taken a hand in supplying the Fleet Air Arm and general reconnaissance units with aircraft for work over the sea. The number engaged in constructing types for the R.A.F. is much larger, but the aim of all Services is to obtain high quality in design and construction without having to multiply heavily the types of aircraft they must use. The firms which have already served the Navy so well stand in a specially fortunate position now that expansion and replacement are to be undertaken. They have become accustomed to naval requirements and as they are mostly engaged already in the construction of military aircraft they may be trusted to offer the latest ideas in forms acceptable to the Admiralty. On the other hand, there are signs that designers who have not yet contributed to the Fleet Air Arm may be able to supply something particularly suitable to the duties of reconnaissance and to the exigencies of deck landings.

TYPES IN SERVICE.

A brief description of the aircraft in use in the Fleet Air Arm and in the general reconnaissance squadrons of the R.A.F. is given below :

FLEET AIR ARM.

BLACKBURN AIRCRAFT, LTD.

Shark T.S.R.—This is a biplane with folding wings and is supplied either as landplane or seaplane. Its metal monocoque fuselage has watertight compartments fore and aft and the cockpits are watertight up to the coaming. A 1,500 lb. torpedo is carried in crutches below the fuselage and there is one fixed gun firing forward and one movable gun in the rear cockpit. Using an Armstrong Siddeley Tiger (700 h.p.) engine the Shark has a top speed of 152 m.p.h., a landing speed of 62 m.p.h., and a normal range of 550 miles.

FAIREY AVIATION COMPANY.

Seal T.S.R.—This Fleet version of the Gordon day-bomber has room for a crew of three and is fitted with catapult points, arresting gear, flotation gear, slinging gear, and other equipment essential to marine operation. It is one of the older types and will probably be among the first to be replaced.

Swordfish T.S.R.—This three-seat biplane has a fuselage which is fabric-covered aft and has metal panels forward. Its undercarriage may be either wheel or float type. The torpedo is carried between the undercarriage legs. Its armament is one fixed gun firing forward and a Lewis gun at the back of the rear cockpit. Fitted with a Bristol Pegasus (700 h.p.) engine its top speed is 154 m.p.h., its cruising speed 131 m.p.h., and its landing speed 67 m.p.h.

HAWKER AIRCRAFT, LTD.

Nimrod Fleet Fighter.—This single-seat biplane has a framework built almost entirely of stainless steel and covered with fabric except for the forward part of the fuselage. Its engine is a Rolls-Royce Kestrel (500 h.p.) and its duration at cruising speed is just under 1¾ hours. It carries a useful load of 960 lb., has a top speed of 181 m.p.h. and climbs to a height of 13,000 ft. in 9·3 minutes.

Osprey Fleet Fighter.—This is a biplane two-seater, also built in stainless steel with fabric covering. It is fitted with a Rolls-Royce Kestrel engine and carries a disposable load of 1,290 lb. Its top speed is 176 m.p.h. and it climbs to 13,000 ft. in 9·7 minutes.

SUPERMARINE AVIATION WORKS (VICKERS), LTD.

Walrus Fleet Reconnaissance Amphibian.—This single-engined flying-boat with a pusher airscrew has a wheel undercarriage which may be swung upwards on either side so that the wheels fit into recesses in the under side of the lower wing. The Bristol Pegasus engine is set on a four-legged mounting between the wings. In the bow and aft of the wings are gunners' cockpits and behind the pilot's compartment is accommodation for the navigator and the wireless operator. It has a disposable load of 2,300 lb. Its top speed is 135 m.p.h., its landing speed 57 m.p.h., and its range 600 miles in still air.

GENERAL RECONNAISSANCE AIRCRAFT.

A. V. ROE & CO., LTD.

Avro Anson.—This twin-engined low-wing monoplane appeared first as a six-passenger commercial aeroplane. For military purposes it has been modified and provided with a rotating gun turret in the upper part of the fuselage aft of the wing. There is also a fixed gun on the left side of the fuselage near the pilot's seat in the nose. The two Armstrong Siddeley Cheetah (310 h.p.) engines are mounted in nacelles in the leading edge of the wing and into these nacelles the undercarriage legs may be retracted in flight. A useful load of 2,713 lb. is carried. With a top speed of 188 m.p.h. the Anson lands at 62 m.p.h., or at 57 m.p.h. if flaps are fitted on the trailing edge.

SAUNDERS-ROE, LTD.

London Flying-boat.—This twin-engined biplane carries a crew of five and in addition to bunks has a galley equipped with cooking stove and ice chest. It has gunrings in the bow, amidships, and in the tail. With two Bristol Pegasus engines its top speed is 155 m.p.h. and its cruising speed 137 m.p.h. On the power of one engine only height may be maintained at 3,500 ft. With special tanks it has a range of more than 1,000 miles.

SHORT BROS., LTD.

Singapore III Flying-boat.—This is the only four-engined flying-boat yet in service in the R.A.F. It is a biplane with four Rolls-Royce Kestrel engines mounted in tandem pairs between the wings. The length of the hull is 64 ft. 2 in., and in addition to living quarters provision is made in the hull for cooking apparatus, work bench with vice, and stowage for drogues, dinghy, engineers' ladders, etc. Besides gun positions in nose and tail there is a gunring amidships on either side. The useful load carried by this boat is just over 9,000 lb., and the maximum loaded weight is 31,500 lb. The top speed is 145 m.p.h., the cruising speed 105 m.p.h., the landing speed 65 m.p.h., and the range in still air 1,000 miles.

SUPERMARINE AVIATION WORKS (VICKERS), LTD.

Stranraer Flying-boat.—This 19,000-lb. biplane flying-boat carries a disposable load of 7,750 lb. and makes a top speed of 165 m.p.h. with a landing speed of 58·5 m.p.h. and a cruising range of 1,000 miles. Aft of the pilot's compartment it has quarters for the navigator and the wireless operator, and provision is made for sleeping quarters, food and water storage, and cooking. There are three gun positions: in the bow, amidships, and in the tail. Its engines are two Bristol Pegasus.

Scapa Flying-boat.—This biplane flying-boat has two Rolls-Royce Kestrel engines set immediately below the upper wing. Provision is made for the fitting of extra petrol tanks under the lower wing when long range is desired. The hull is less roomy than that of the Stranraer, although equipment is carried for long-distance cruising. There are three Lewis gun cockpits: forward, amidships and aft, and the military load includes five drums of ammunition for each gun and 1,000 lb. of bombs.

E. COLSTON SHEPHERD.

CHAPTER XII.

THE INFLUENCE OF "AIR" UPON LIFE IN THE NAVY.

THE sailor's life and its multitudinous professional details have always been built up around the same problem, that is, the achievement of the "safe and timely arrival" of his ships at their destination. It is the duty of the Navy to fulfil the first part of that task, and to secure immunity for the mercantile marine from interference in war. But it has at all times, in greater or less degree, been a necessary part of the technique of every sailor to call to his aid advancing science in his efforts to contend with those adversaries the wind, the sea, fog, darkness and hidden natural dangers, rivals, pirates, and his country's enemies on (and more recently also below) the sea. And now to the menace of these dangers (most of which, though evolution may have changed their form from time to time, still demand a constant and ever-growing repertoire of technical skill on the part of the seaman) must be added that which the aeroplane has introduced.

Fortunately this development has not contributed only to the tale of adverse factors in the seaman's struggle : it has, as is now well recognised, added very materially to his capacity for defence and to the value of the weapons with which he can provide himself in attack. Meanwhile, of course, the demands upon his technical skill in using his older weapons, and the variety of new personal roles which he is obliged to play in the fulfilment of his main task, are daily increasing.

Arising from these facts comes the very natural question: To what extent in practice does this "air" development alter the outlook for the naval officer of the future ? How far, in fact, will it be true to say that the *modus vivendi* of a boy now entering the Navy as a cadet is to be altered from that of a purely maritime life ?

Hitherto, the number of naval officers who have been brought into close personal contact with aviation has been a relatively small one. Hardly a tenth of the lieutenants and lieutenant-commanders of the Executive branch have been employed on actual flying duties ; there have not, since the war days of the Royal Naval Air Service, been any shore aerodromes or seaplane stations belonging to the Navy—all have been manned by the Royal Air Force. Even the number of the anti-aircraft batteries on board our ships has, until very recently, formed but a relatively small part of the whole of our gunnery effort. As the direct consequence of these limitations, of course, our naval staffs at the Admiralty and elsewhere have contained but a minor number of officers whose effort was mainly directed upon matters concerned with "air."

If the limited amount of "aeration" which the Navy has so far undergone needs any excuse, one would be inclined to attribute it perhaps to three factors. The first and most obvious one is that during the recent years our national defensive policy has included a provision that the main responsibility for all kinds of air work should, for the sake of homogeneity, versatility, and economy of effort, remain, undivided, in the hands of one Service only. The need for specialisation on a scale which precludes the continuation of that policy has now become evident, and the recent decision of the Government to turn over entirely to the Navy that part of that Service which was embarked in ships of the Royal Navy (the Fleet Air Arm) was the result.

The second factor, which can be considered to have had even more influence perhaps, is that during the late War very little impression was made upon either tactics or strategy by the aeroplane in naval warfare. The aircraft carrier as it is now known did not actually exist; catapults had not been developed; and, apart from a few operations by shipborne seaplanes, the whole of the work of the Royal Naval Air Service was carried out from aerodromes and seaplane bases distributed round the coasts. The consequence was that that arm of the Navy was, even then, virtually a separate service.

Finally, technical progress in the use of aircraft for naval purposes, and in the development of attacks by aircraft on ships appear to have made much slower progress in the years since the War than have air developments for other purposes. This is without doubt to be accounted for by the fact that but few occasions have arisen for their employment against or in support of ships on active service in any of the minor wars or other operations of the post-War years, and no occasions for their employment in conjunction with important naval forces in sea actions.

The position, however, is now considerably changed. Many former uncertainties as to the value of aircraft both in attack and defence at sea have recently been cleared up, and the development of technical features in both ships and in naval aircraft has been much accelerated. With this change have also come a corresponding improvement in the personal technique of "naval co-operation," and many useful experiments and trials in the development both of anti-ship bombing and of anti-aircraft firing. Certain most important lessons in both of these directions can be deduced from incidents in the Spanish and China wars. These facts, together with the new organisation which places naval air units within the administration of the Navy, can no longer leave any doubt that a new epoch in technique and equipment is already begun. The object of the Navy is unchanged, to secure a safe passage for our shipping; but from henceforth all those in it will be obliged to realise that it is a profession actively concerned not only with all that passes upon the surface of the sea and underneath it, but also with many kinds of activity of fast-growing importance to ships, of all sorts and occupations, which take place in the air above them.

The questions which are bound to interest most students of naval affairs now are: How far is the average naval officer of the future likely to become personally involved? What new technique will he have to learn? What will be his liability to fly? What new responsibilities involving a knowledge of "air" matters will fall on his shoulders? Will all this mean a new kind of specialisation within the Navy, or will it have to be included in the stock-in-trade of every general service officer?

NEW TACTICS.

In order to realise the way in which officers and men throughout the Fleet may become involved in new forms of technique, it is perhaps necessary to have a picture before one of the many tactical operations which have grown up during the last few years as the direct result of the application of aircraft to naval warfare.

Broadly speaking, there are four distinct spheres in which tactical innovations are being developed. These are not named in the order of their importance, but rather in the sequence in which they have achieved importance to the Navy. They are:

(1) Assistance to warships in the development of their own attack against enemy vessels.

(2) Direct attack on ships by aircraft-borne weapons.

(3) Defence of ships against airborne attack, by means of self-contained defences.

(4) Fighting between aircraft arising in the course of the above.

AIRCRAFT AS AN AID TO SHIP ATTACK.

This form of air tactics was introduced at a very early date in the late war in the form of searches, of detailed reconnaissance of enemy movements and formations, and of spotting for gunfire. In addition to these, and more recently, other forms of close co-operation between aircraft and ships in helping the latter's normal operations have also shown themselves capable of a high degree of useful development. These include chasing submarines, locating and destroying mines, and convoy work.

In each of these functions a naval officer in the aircraft is principally necessary as an observer, for tactically the pilot holds a relatively subordinate position. This does not mean that even in this form of naval air work a general background of naval knowledge on the part of the pilot is not needed, for it does in fact contribute essentially to the teamwork between pilot and observer so necessary for its success. Indeed, on those occasions when the aircraft operate from a ship as opposed to a shore base, a further specialised knowledge on the part of the pilot is necessary in connection with the actual catapulting, taking off from a carrier, deck landing or, in the case of a seaplane, recovery by its parent ship.

The technique required, moreover, includes the capacity for accurate oversea navigation and for very efficient wireless communications with the ships concerned; a thorough knowledge of the appearance of all classes of ship and their various functions in war; of gunnery, and of the fighting instructions generally; and it involves a very considerable amount of practice between the personnel of both the aircraft and the ships themselves. In each of these functions also, special knowledge is not needed only by the personnel of the aircraft. The officers and men on board the ships to whom the aircraft are giving their assistance require, besides their own specialist technique, an accurate knowledge of all that the aircraft can do. A technique of mutual communication and action is demanded by these forms of co-operation. There is, finally, the technique of the personnel needed for the launching and recovery of the aircraft, as well as for their housing and maintenance, to be conducted safely and economically.

DIRECT ATTACK OF SHIPS BY AIRBORNE WEAPONS.

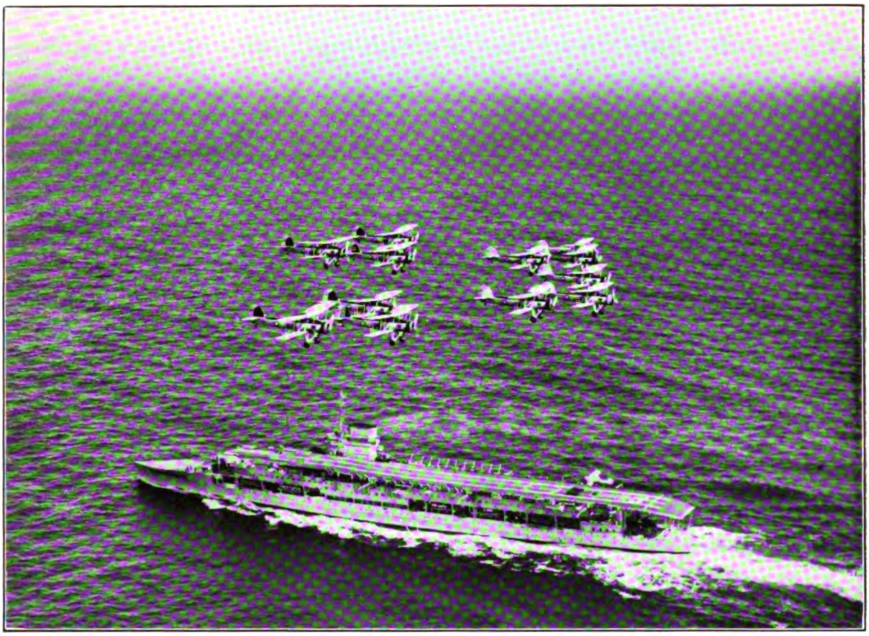
A large part of the Fleet Air Arm is trained and equipped for the attack of enemy ships. This is now a part of naval warfare. It involves new tactics, an intimate knowledge of warships and their means of defence, of their vulnerability from the air, of the difficulties inherent in making the aim at such targets (so different from those which do not move) with bomb, torpedo, or other weapon, of the specialised navigation needed to find the enemy and afterwards return to the parent ship or base.

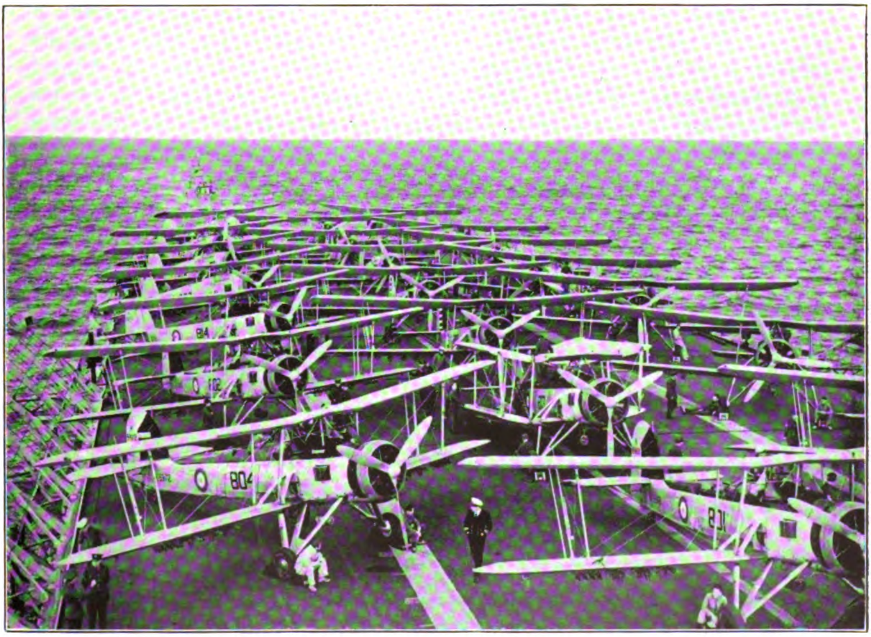
There is a greater responsibility on the aircraft unit commander in making these attacks than in any other kind of naval air operation. The indications of identity of a supposed enemy are often very scanty, the choice of moment and manner of attack often of vital importance; as many unfortunate incidents during the past year in both the Mediterranean and in the China dispute have shown, fatal mistakes can easily be made. Both the attacking units and the staff need a very full comprehension of all the special problems of air attack on ships at sea. On the flying side also the technique required is different from that of other air operations; torpedo dropping, for example, is a specialist branch by itself, demanding elaborate training arrangements of its own.

DEFENCE OF SHIPS AGAINST AIRBORNE ATTACK.

Much important training has to be given to large numbers of officers and men in a modern warship on this account. Not only, moreover, are large numbers of various forms of anti-aircraft gun now mounted in every ship, but local training is of course also needed for dealing with the possible damage from air attack.

In the handling of the ships also a new technique is being evolved for the combined purposes of minimising liability to "hits," and of developing to the full the resources of ships in company for mutual support in defensive gunfire. An interesting example of such support is given by the history of operations in the early days of the late War





FAIREY "SWORDFISH" TORPEDO-SPOTTER-RECONNAISSANCE AIRCRAFT.

(Top) In Flight above H.M.S. Glorious.
(Bottom) Assembled on the Deck of the Carrier.

(By courtesy of Messrs. Fairey and "The Times.")

off the Belgian Coast; destroyers of the Dover Patrol, which were often subjected to very low-flying attacks by German seaplanes, could make very little use of their guns, because the elevation obtainable was too small to allow them to engage aircraft immediately above themselves. So they developed the idea, which is probably the earliest recorded form of special anti-air tactics, of separating from each other sufficiently for each vessel to be able to bring its guns into action on the aircraft attacking another.

Wireless controlled aircraft, towed air targets, and other kinds of apparatus involving flying which are directly connected with anti-aircraft training are now familiar items in the Fleet. Few officers or men of the executive branch of the Navy do not make contact with and require a special knowledge of one or other of the above forms of air work.

FIGHTING BETWEEN NAVAL AIRCRAFT.

Speculation on any aspect of the naval action of the future is hazardous; the mechanical factors are well known, but their effect upon each other is, to say the least, highly problematical. The personal factors under modern conditions of warfare are hardly any easier to gauge. But of all these uncertainties none is more uncertain than the extent, the chances of success, and the final consequences to the main issue in a naval action, of fighting in the air between the aircraft belonging to the respective combatant forces.

We are aware that in many respects the tactics likely to be employed by such fighters and the aircraft they attack will be bound to resemble those employed by land-type fighters in the attack of land-type bombers, for example. On the other hand, to a large extent, air tactics are conditioned by the nature of the operation which the attacking fighter is attempting to stop. Spotters, for example, may fall easy victims because of the necessity for them to remain relatively fixed, so to speak, at a low height and in a very circumscribed area.

On the other hand the conditions for the fighters are not likely to be so easy as they are on land. On land they are more often able to get a considerable warning of the approach of an attack by bombing formations than are fighters at sea. Again, the limitations inseparable from the use of carriers as aerodromes and the necessary restrictions on the number of aircraft of all kinds which a fleet can carry, would seem to make the use of constant air patrols a practical impossibility. All we can definitely say is that we must not be found deficient in this important arm.

THE FLEET AIR ARM TO-DAY.

Is not every fleet, every squadron, every ship affected in some important way by the presence of the new element in naval tactics? Is not the hangar, the catapult, or the crane a feature (a most conspicuous one) now to be seen in the profile of every new ship? Have we not six aircraft carriers already in commission (or reserve) and a further five on the stocks ? Are there not already some 250 naval pilots and observers in a list of under 2,000 lieutenants and lieutenant-commanders ? These are the proportions which, with a relatively small share in the administrative work of the Fleet Air Arm and a comparatively undeveloped force, numerically, the " aeration " of the Navy has already reached.

THE SIZE OF OUR FUTURE COMMITMENT.

Having seen the *manner* in which aviation is penetrating into every aspect of naval life, it is still necessary to measure the probable *extent* of our commitments in air work before a reasonable estimate can be made of the chances of any individual officer having to take up actual flying duties.

Judging by the present size of the air arms of the principal foreign naval powers, and by the building programme at present being embarked upon by the British Fleet, it would hardly seem unjustifiable to estimate that our own Fleet Air Arm would be increased to something well over 600 first-line aircraft within the next few years. Taken in comparison with its present size and the present strengths of personnel (pilots and observers), this should mean a very large increase in the number of officers which it should be necessary in the future to train in naval air duties.

OFFICER STRENGTH.

The new organisation, moreover, under which it is expected that the Fleet Air Arm will in future be manned entirely by naval personnel instead of partly by the Air Force, will inevitably make a still further proportionate demand upon the officers lists for specialists in this branch.

It has been expected for some time that a proportion of naval ratings will, under the future arrangements for " navalising " the Fleet Air Arm, be trained as pilots as well as observers. Thus the basis of manning, at present standing at the very high figure of nearly two officers per aircraft, could be reasonably reduced. But it can hardly be expected that, in view of the highly specialised and important duties which naval aircraft now have to carry out, any new organisation could efficiently bring about a reduction of that figure to less than one per aircraft. To the total, at this minimum figure, would of course have to be added the usual margin of specialists for technical staff duties and for other administrative purposes. A well-balanced Air Force has a total of somewhere between two and two and a half officers per aeroplane.

This rough estimate would seem to place the Navy's future requirements in air specialists at somewhere approaching a thousand officers, a very large figure indeed in relation to our present total strength in lieutenants and lieutenant-commanders. Added to this demand it would also seem likely that future arrangements will have to be made for building up some kind of a reserve, of similar proportions. In view of the huge dimensions of these demands, some kind of special entry for officers on a short service basis appears inevitable.

A special entry for such officers, suitable principally for "air" duties in the Fleet, should not be difficult to recruit. There already exist two large and important bodies of reserve officers, the R.N.R. and the R.N.V.R., whose members are in varying degrees trained in many of the subjects which are a necessary part of the educational equipment of a Fleet Air Arm officer, for example, in gunnery, signals, and navigation. There is also a considerable number of young men passing every year through our Mercantile Marine training establishments, who, as well as having a good grounding in navigation and other naval subjects, enjoy in some cases, opportunities of learning to fly. Besides recruits from these sources there should still be many amongst the students at the public schools and universities who would be keen and eligible physically and (by a "modern side" training) educationally, should the opportunity be offered to take up this specialised branch of flying. There are certain attractions in the life of the Navy which would be in no way diminished through belonging to its flying branch.

Apart, however, from special entries of the above sort it would obviously be a great benefit for the Navy to be able, at any rate for a time, to reinforce its new air personnel with some officers from the Royal Air Force who might be available, and willing, to offer their services. Many of them already have some personal acquaintance with the naval requirements, and all have of course the advantage of having already received an unequalled training in flying. Obviously the Royal Air Force would not want to continue indefinitely to provide officers for this branch of the Navy, but at the outset of the new régime it may reasonably be expected that some of the margin already provided in the Air Force for manning the Fleet Air Arm under the old régime might be allowed to come forward.

But in the main it is presumed that the majority of Fleet Air Arm posts will be filled by naval officers from the permanent lists. In naval air units there will always have to be a high proportion of officers who will continue in the Navy, partly for the sake of providing a nucleus from whom to draw officers in every way qualified for the command of these air units themselves, and partly in order always to ensure that there shall be a high proportion of the senior naval officers of the future who will have had active personal experience of naval air work.

CONCLUSIONS.

One arrives, therefore, at the conclusion that a real change in the nature of his future duties is now in store for a considerable number of those who will henceforth join the Navy. This change will not necessarily mean less sea time, less chance of seeing the world, or any reduction in the prospects of promotion for those regularly entered officers who take up flying as their line of specialisation. Nor would it mean that fewer could specialise in the other ordinary branches of specialisation: gunnery, torpedo, navigation, and so on.

But it does probably signify that upon every "regular" naval officer will fall in the future some responsibility of a newer kind more or less directly connected with air work, flying, or some control of those who do those things. And in so far perhaps as a certain lag has hitherto characterised the "aeration" of the Navy as a whole, so is the process, just now begun, of catching up likely to be felt with a certain intensity and suddenness. In this respect other navies have already got some way ahead and aviation is taken as part of the day's work. For the British Navy, unfortunately, expansion in other arms is also taking place simultaneously with the maturing of its "wings"; while the process may be more drastic than if it had occurred at another moment, the scope for individual effort should prove all the more encouraging for those who are prepared to enter the arena under the new conditions.

"VOLAGE."

CHAPTER XIII.

INFLUENCE OF AIR POWER UPON THE CONTROL OF SEA COMMUNICATIONS.

No one who makes any study of modern weapons of warfare will deny that the aeroplane has had a profound effect upon the conduct of war, but exactly what effect it has had on the relative abilities of land and sea forces to bring a war to a successful conclusion are subjects upon which no general agreement is yet possible. It is the purpose of this chapter briefly to examine the influence of air power upon the ability of naval forces to control sea communications.

THE NAVAL OBJECT.

The object of the Navy in war is the control of the sea communications which are involved. Such control allows the Power which gains it to ensure safe passage for its own ships and to deny safe passage to all enemy shipping. This control confers benefits both offensive and defensive. On the one hand armies may be transported abroad and supplied by sea and considerable economic pressure may be exerted upon an enemy by the deprivation of his sea-borne commerce. On the other hand, security is given to one's own sea-borne commerce and one's possessions are protected from invasion. Control of sea communications is exercised by cruisers, which sweep the seas clear of enemy cruisers and commerce raiders. These cruiser operations are covered by the action of battleships, which either destroy the enemy's battleships or neutralise them by being stationed in secure bases so situated geographically that the enemy's heavy ships cannot emerge and overcome the control which is being exercised by the lighter craft without being brought to battle.

British naval history abounds with examples of this policy. Control of the sea communications by frigates and cruisers has been exercised in almost all our wars, when cover has been provided in either or both of the two ways referred to above. Examples of the destruction of the enemy's battleship cover and its influence on the exercise of control, such as the Battle of Trafalgar in 1805 and the Battle of Tsushima in 1904, are too well known to require further comment here, while examples of effective neutralisation can be found in the naval operations against the French prior to Trafalgar and our own naval operations during the Great War. In the Napoleonic Wars prior to Trafalgar, from bases in the West Country our heavy ships kept the French Atlantic fleets in check, while in the Great War the Grand Fleet watched the German High-Seas Fleet from Scapa Flow.

Many writers have discussed the exercise of control, but before dealing in more detail with this subject here, the methods of disputing control which are open to an enemy whose battle fleet has either been destroyed or neutralised should perhaps first be mentioned. There are really two policies which he can adopt. He may either use every effort to carry out surprise sporadic attacks against the controlling battle fleet, with the aim of weakening its ability to provide cover or to reduce its margin of superiority with a view to a subsequent naval battle on favourable terms ; or he may ignore the armed vessels and confine attacks to trade and transports. Both these policies were adopted at different times by the French in the Napoleonic Wars and by the Germans in the Great War. In the early part of the Great War, for instance, the German submarines were employed extensively in operations against our naval forces in the North Sea, whereas subsequent to 1916 they ceased their attack against our naval forces and engaged in direct attack against our trade.

METHODS OF CONTROL AT SEA.

Actual control of the sea communications is exercised by cruisers, which sweep the seas clear of all enemy shipping both naval and mercantile. The extent to which this becomes truly effective depends upon the policy of disputing control which is being adopted by the enemy. If his efforts are mainly directed to sporadic operations with the object of weakening battleship cover, naval operations may be localised to a great extent and normal shipping methods may be continued in other areas with little alteration. If, however, he adopts the alternative course, direct protection must be given to shipping by instituting the convoy system and escort and by undertaking combined operations directed against the bases which harbour his raiding craft. Examples of this latter operation can be found in the operations against Zeebrugge and Ostend in the last year of the Great War.

BASES.

Fleets, in common with armies and air forces, require bases for repair, refuelling, rest, and recreation, and of necessity large shore establishments must be provided and large quantities of fuel, ammunition, stores, and food-stuffs must be maintained at them. For the proper and efficient functioning of this vital administrative service, the bases selected must be secure from enemy attack. Prior to the advent of aircraft, security was obtained by the cover against sea-borne attack provided by the action of the Fleet, by the selection as far as possible of island bases or bases without vulnerable land frontiers, and by permanent garrisons of soldiers. In the past, in fact, it has been the possession of island bases situated throughout the world, which were not in danger of land attack, which provided the sure foundation of British naval power. Malta, Ceylon, Singapore, Hong Kong, and Kingston, Jamaica, were all chosen with this end in view. Moreover, if islands could not be found bases were chosen which were sited on quasi-islands, such as Gibraltar, or where powerful potential enemies had no inland possessions within reach, such as at Aden, Freetown, and Capetown, to mention but a few.

In those days no base was considered reasonably secure once it came within range of hostile shore artillery. With the advent of aircraft of long range, able largely to disregard the operation of surface and land forces and natural geographical obstacles, the defensive advantages of small defended areas are considerably diminished. If they have no space for the establishment of aerodromes and adequate air-defence organisation, they are at a serious disadvantage. Compare, for instance, the security which Malta enjoyed in 1914 and its security to-day. In 1914 the fact that it was a small island with an excellent harbour for the Fleet gave it almost complete security. In 1938 numbers of aerodromes from which it could be attacked are available within close range. On the other hand, few aerodromes can be provided for its defence, the position of these cannot be hidden, and no depth is available for an adequate air-defence organisation. It cannot, in fact, any longer be called secure.

INFLUENCE OF THE FLOTILLA.

Let us turn to consider the effect of the flotilla of small craft, coastal motor boats, and submarines in the past upon the ability of a Navy to exercise control once it has obtained the necessary cover. Experience of the last War shows that the operation of submarines gravely circumscribed the freedom of movement of the Battle Fleet, and forced it to restrict its cruising and to institute the most elaborate anti-submarine precautions. These required the continuous use of large numbers of destroyers and aircraft, which were urgently required not only for the direct protection of merchant shipping but also for many other purposes. The flotilla, even in pre-aircraft and pre-submarine days, has often forced convoy upon the controlling Power and has always contained large numbers of small craft engaged on protective duties. It has, moreover, necessitated the undertaking of complicated combined operations to deal with the bases from which the privateers were operating. Compare, for instance, the operations against the French small craft in the early years of the nineteenth century.

During the Great War the effect of the efforts of the German submarine to dispute control by the direct attack of our merchant shipping narrowly approached success in spite of our overwhelming superiority in surface craft of all kinds. This success was largely gained by the power of the submarine to operate unseen, and because of this quality their future potentialities cannot be ignored, and have exercised unceasingly the minds of naval constructors and strategists. Aircraft, which are able to a considerable extent to deprive the submarine of its greatly prized invisibility, proved to be one of the most effective means of reducing its operations to manageable proportions. Aircraft were also able directly to attack submarine bases unsupported by other forces, and provided an alternative to the elaborate combined operations which had previously been considered essential. At this time, of course, aircraft were in their infancy. Their effect to-day, particularly in the offensive sphere against submarine bases, would be enormously more important.

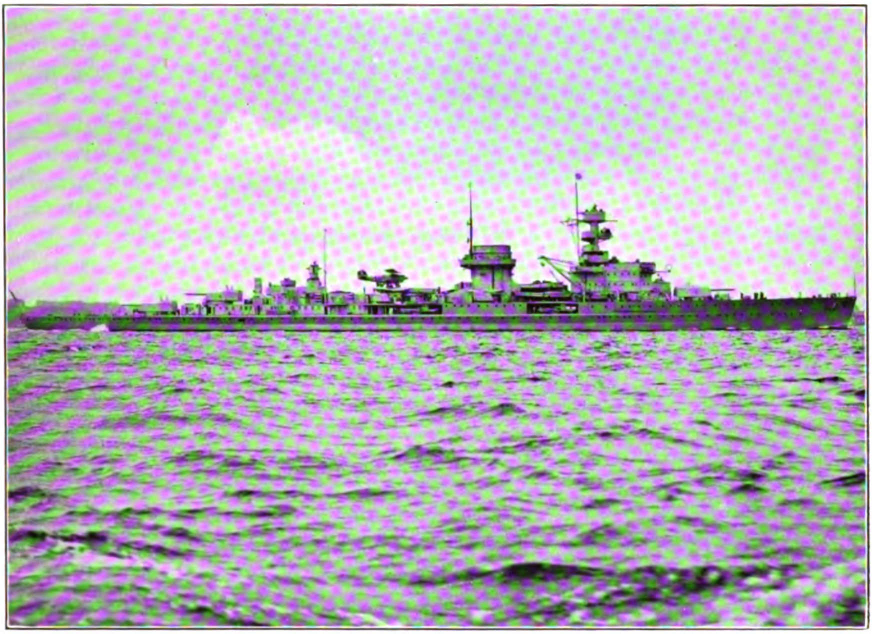
THE MORAL EFFECT.

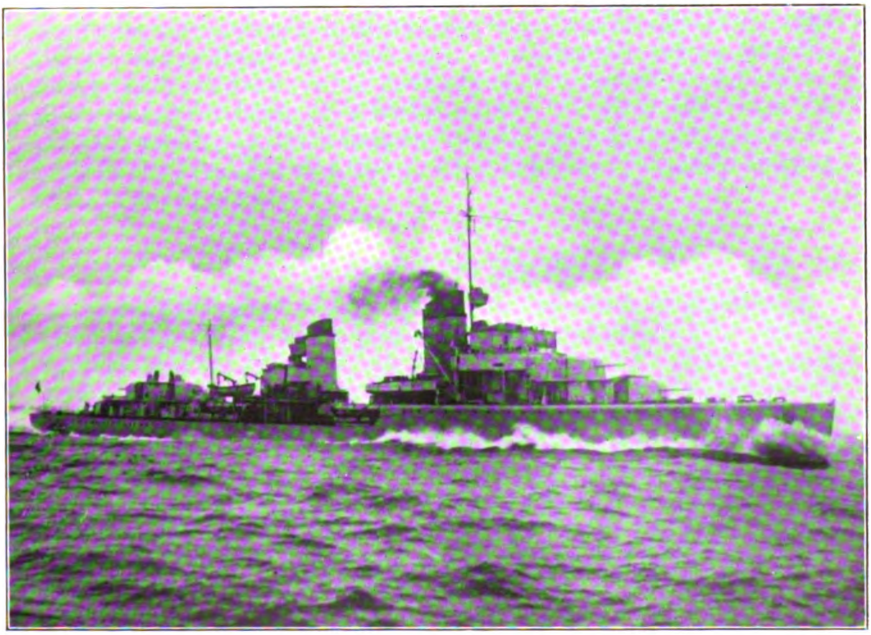
It is of interest to note that it was not great losses suffered by the Battle Fleet from the submarine and the mine that forced restriction of movement upon the Fleet. During the whole War our capital ship losses from these dangers were in fact extremely small, but the inherent possibilities of these unseen dangers made us treat them with perhaps exaggerated respect. The effect of aircraft may be expected to be greater materially than the effect of the mine and the submarine, owing to the much greater flexibility and speed enjoyed by aircraft, and consequently the potential threat will be proportionately greater still. It must have a considerable effect upon the minds of fleet commanders, and may well be sufficient to keep fleets at a respectful distance from shore-based air forces.

CAPABILITIES OF AIR FORCES.

It is not easy for the layman to appreciate the amazing flexibility and mobility of aircraft. They can fly far and fast in almost any weather ; they can surmount all natural obstacles ; they can search large areas and carry high-explosive bombs, fire, and gas to any locality within range of their bases. Within certain limits the same aeroplane can be used to attack targets at sea or on the land at will. Modern aircraft now in production have ranges of up to 2,000 miles at speeds of more than 200 m.p.h., and are capable of carrying bombs or torpedoes up to several tons in weight. In the near future several thousands of such aircraft will be available in the hands of potential enemies, and they can be produced in war a great deal more rapidly than can surface vessels.

Without going into such questions as to whether bombs will sink battleships or whether international rules of war will be adhered to, we can assume as axiomatic that under normal conditions aircraft can locate and attack a concentrated or scattered battle fleet, whether at sea or in harbour, if they are within range. If they obtain surprise, which is probable in certain conditions of weather, they will be able to secure hits. Governments must therefore be influenced in the selection of bases in which to station the naval forces by these possibilities, which will undoubtedly influence admirals also when they are operating fleets within reach of numbers of enemy shore-based aircraft. As few admirals in the past would enter a mined area until it had been swept or an area which was known to contain enemy submarines if they could avoid it, so now an admiral would be most unwise if, in manœuvring to attack an inferior enemy fleet, he was led into range of a superior air force trained in the art of attacking ships.





(TOP) THE GERMAN CRUISER NURNBERG.

Completed 1935.

(BOTTOM) A GERMAN DESTROYER, "Z" TYPE.

Completed 1937.

(*By courtesy of the German Navy.*)

Recognition of this threat has already had its influence upon design as is evidenced by the bomb-proofing of the latest battleships, the provision of large numbers of large and small calibre anti-aircraft guns, and finally by the introduction of anti-aircraft cruisers themselves. Naval bases, however, cannot be given the same direct protection that can be given to ships, nor can they readily be moved. The bases, therefore, are relatively more vulnerable than the ships themselves, particularly where space for aerodromes for defending aircraft is restricted or where an area for the establishment of an adequate warning system is not available. This being so, the security of existing bases within range of air attack must be considered to have been weakened, and the tendency is likely in future to be for bases to be established as far away as possible from hostile air bases, with a consequent weakening of the power of fleets based upon them to provide cover or exercise control.

The restrictions which aircraft can impose on the movement and manœuvre of fleets outside their bases will tend to make them avoid narrow waters or the enemy coasts. Consider for a moment the naval operations at Gallipoli in 1915 and compare them with similar operations which might be undertaken in this area to-day. If the Turks in 1915 had had an adequate modern air force, the naval concentration could not have taken place until that air force had been destroyed. If it was true in the past to say that a combined operation could not take place unless the sea communications were adequately secure, it seems even more true to-day to say that the air communications must also be adequately secure and the enemy air force destroyed or neutralised as a necessary preliminary to a successful landing on a hostile coast. We have lately seen the extreme care which the Japanese took to neutralise the Chinese air force in the Shanghai area before they undertook the major landing of their forces there.

AIR ATTACK ON TRADE.

Aircraft, however, are not limited to the attack of warships and naval bases. What of the possibilities of direct attack on merchant shipping and the direct attack on merchant ports ? We have seen during the Spanish and Far Eastern conflicts now in progress direct attack on merchant shipping being carried out by aircraft. Although no conclusive results can yet be deduced from these operations, it seems clear that a country with an air force, but no effective navy, is able to exercise a considerable influence on enemy shipping which passes within range of its coasts owing to the ability of aircraft to find and attack it at sea, even if the air forces available are either insufficiently strong effectively to attack the seaports to which the enemy shipping is proceeding, or cannot reach them. This would seem particularly true if the threat from submarines or commerce raiders is so severe that convoy has to be instituted. Owing to the lessened security of naval bases and naval forces generally, and their consequently lessened power to provide adequate cover, the convoy system is likely to be forced upon a naval power dependent upon sea communications earlier rather than later. The concentration of shipping into convoy, however, greatly simplifies the problem of an air force whose task it is to attack such shipping. If any sort of protection against air attack is to be given to convoys which have to pass within range of hostile aircraft, a double set of escorting vessels would be required, an anti-aircraft escort as well as an anti-submarine escort, which would throw additional burden upon our always inadequate supply of escort vessels. From small escort vessels which alone might be provided in any numbers, anti-aircraft fire is likely to be very ineffective owing to the instability of the platform provided. When shipping has to pass within range of hostile shore-based aircraft, therefore, the aircraft attack is likely to be more effective than the A.A. defence. In the past shipping could continue to follow normal routes provided that the Fleet controlled the sea communications. In future trade may have to be routed to avoid certain narrow waters, even if the enemy has no naval vessels whatsoever. In certain circumstances, for instance, we might have to abandon the use of the Red Sea and the Mediterranean routes, or we might even have to give up using the English Channel, and this notwithstanding all that a vastly predominant navy can do.

Considerably more dangerous, however, is the power of aircraft to attack vital merchant seaports and either to destroy their facilities for handling goods or to dislocate their efficient working and to cause great loss, inconvenience, and congestion to the shipping. A Power possessing a strong air force could effect such disorganisation in certain circumstances even if it has no naval surface forces at all, provided that it has air bases within range. In pre-aircraft days sea-borne trade and the shore organisation to handle it could only be attacked by sea-borne forces.

NEW LIMITATIONS ON NAVAL POWER.

Now that forces are available that can disregard the oceans and their hereditary guardians to a considerable extent, the Navy's ability to safeguard sea-borne trade suffers in the following ways :

(1) from the power of aircraft to reduce the security enjoyed by existing naval bases ;
(2) from their power still further to circumscribe the freedom of action of battleships which provide the cover for the operations of cruisers ;
(3) from their power to ignore control exercised by surface forces and to attack merchant shipping at sea anywhere within range ;
(4) from their power to attack harbours, seaports, and docks within their range in spite of all that the surface fleet can do.

AIR DEFENCE.

It is because these potentialities of aircraft, among others, were recognised that the idea of one central air defence organisation for the British Empire has been the guiding idea which has directed the growth of the Royal Air Force. The most direct method of dealing with aircraft attack is to destroy the air organisation upon which such attack is based. To do this a large force of bomber aircraft is necessary, whether targets are engaged whose destruction is likely to weaken the enemy people's will to war, to disorganise aircraft production, to destroy his active air force, or to co-operate with land or sea forces engaged in the same task. Complementary to this offensive organisation an air defensive organisation is maintained in the Home Country. This consists of fighter aircraft, anti-aircraft guns, lights, balloon barrages, observer systems, and air-raid precautions arrangements, and is designed to provide some measure of direct security against air attack. It is also designed to take such toll of enemy bombers that their aim will be poor and their will to penetrate the defences will be weakened.

The problem confronting the British Empire of dealing with air attack is unlike that of any other country. No other nation is so dependent upon the proper functioning of its maritime organisation or so geographically situated that a large part of that organisation is within range of hostile air attack. The British Empire, therefore, has to take a different view from other people regarding the organisation of its defence forces. Without air security this country could hardly carry on in war save with the greatest difficulty, if at all, and that in spite of an overwhelming naval surface preponderance.

Predominant air power, in fact, is an essential to the control of sea communications, for without the cover provided by such air power the naval organisation for exercising control cannot function any more effectively than it could in the past if the Battle Fleet was unable to provide the necessary cover.

"SECURUS."

CHAPTER XIV.

EXPANSION OF NAVAL AIR FORCES.

SHIP-BORNE AIRCRAFT.

DURING the Great War most aircraft carried on board ships had to be hoisted out of and into the sea. Landing on the decks of ships was so perilous and experimental that aircraft so operated could play little part. The art of operating aircraft from ships may be said really to have started after the War, and the expansion of this arm (the Fleet Air Arm as it soon came to be designated) has been remarkable. The Royal Air Force has, since the War, made tremendous strides at a time when great strides were usual, but it had war experience of operating large numbers of aircraft, even though their design was primitive in the light of our present knowledge.

Those responsible for organising and working the Fleet Air Arm were faced with an entirely new problem. The following approximate figures show how the expansion has progressed and is progressing: in 1922 there were 15 ship-borne aircraft; in 1925 there were 57; now there are 162; an estimate for 1940 is 240. These figures apply only to the aircraft borne in ships which worked, or were suitable for working, with one of the main Fleets.

FIRST STAGE OF THE EXPANSION.

In 1922 we had the Argus, the United States had the Langley, and the Japanese had the Hosho, all in many respects similar.

The Argus worked under very difficult conditions. In the first place her arrester gear was unsuitable; it sometimes failed to arrest aircraft, and occasionally diverted them overboard when they would otherwise have alighted in safety. The initial training of pilots in deck landing was particularly perilous and it was inevitable that there should be a large proportion of accidents. People became nervous not only in the air but also on board. An elderly officer in the Argus while watching deck landing from the starboard navigating position narrowly escaped injury when a pilot bringing his aircraft on board swerved to starboard and crashed. Shortly afterwards the same pilot coming in to land hit the back of the flight deck, and his aircraft dropped down on to the quarter deck, which had been chosen by the unfortunate gentleman as a safer viewpoint. After that he developed an unshakable conviction that this particular pilot was making a dead set at him, and always withdrew to the wardroom whenever he was about to land.

The Argus had a lot to do in addition to this training: she had to provide aircraft for Fleet reconnaissance, spotting, and attack and had also to carry out extensive trials of new material.

Reconnaissance aircraft at that time had orders to keep within sight of the outermost units of the Fleet, so they flew to and fro, having no opportunity to practise the air navigation in which they had been trained, and they seldom made a report to the Commander-in-Chief of which he was not already well aware. It may be said that the Fleet had no confidence in its air reconnaissance.

Some progress was made in aircraft spotting. It began to be realised that a man in the air could see much that the spotting Officer could not, and at that time spotting was the duty which most interested the Fleet. Fighters had little opportunity of exercising their primary function, and spent most of their time practising deck landing and flying in close formation, which they did very well.

Much of the equipment tried out by the Argus is even now only coming into fulfilment. Some of the trials were laughable. For example, she tried out some wireless controlled aircraft—the forerunners of the present Queen Bee. The aircraft was only about a third size; it was switched on from on deck, and rested on a separate wheel undercarriage from which it was hoped it would soon ascend. In order to prevent the undercarriage going overboard some elastic shock absorber material was attached to it. On one occasion the aircraft unfortunately developed only about half its correct revolutions, and instead of taking off taxied to the bow, fell over, and was rammed by the ship. The force of the propeller and the weight of the aircraft had stretched the elastic and there was only the wheel undercarriage to come back. This it did at a very high speed, breaking the legs of the cameras recording the trial, and but for the remarkable agility of the people operating them would undoubtedly have broken their legs too.

Summing up the air activities of that period it may be said that the Argus made great progress in very difficult circumstances, and so evidently did the aircraft carriers of other countries at the same time.

THE SITUATION IN 1925.

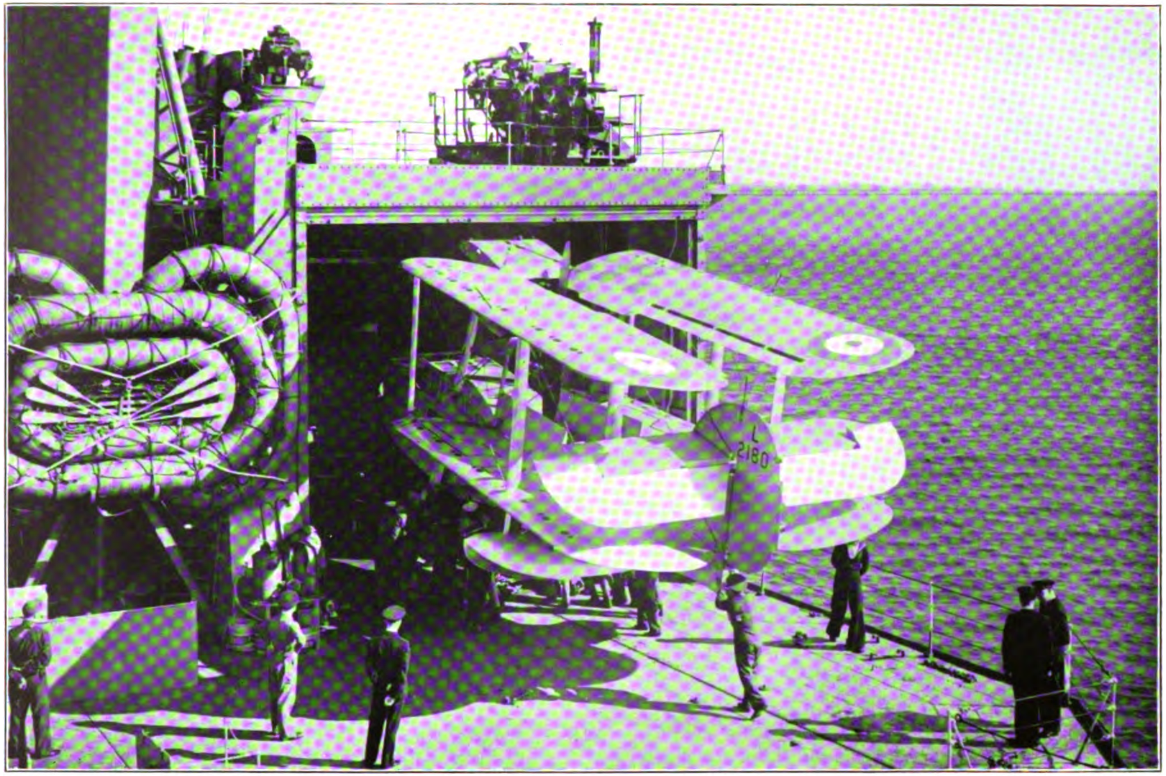
By 1925 the Eagle was working with the Mediterranean Fleet and the Furious with the Home Fleet. These two ships when they met engaged in friendly and healthy rivalry which did much to promote efficiency. Reconnaissance particularly came to the fore; the restriction that aircraft were to keep within sight of the surface units was still in force, but it was known that it was soon to be altered, and it was tacitly ignored; indeed, aircraft in those days penetrated nearly as far as they do now. The Fleet had come to place great confidence in air reconnaissance, sometimes too much. In one exercise the Red Fleet sent his aircraft out to look for Blue, but they failed to find it, although it afterwards transpired that Blue was only about fifty miles away. Red was horrified at this and made adverse criticisms of the power of reconnaissance aircraft: one could not trust them as one could cruisers. Actually those criticisms were most unfair, because the Red aircraft had been sent out on patrol lines which did not bring them within sight of the enemy.

On another occasion the Commander-in-Chief reversed the course of his Fleet on the strength of one aircraft report, which afterwards turned out to be wrong. However, air reconnaissance proved on the whole most successful and made a profound impression on the Navy.

Aircraft spotting continued to make slow but sure progress. The fighters, with the increasing number of aircraft available for them to attack, gained considerable experience.

Formerly, when the Fleet was cruising near shore aerodromes opportunity had been taken to arrange for attacks by shore-based torpedo-carrying aircraft, but the occasions when a large Fleet was available were few and there was little opportunity for subsequent discussion of the attacks. Now for the first time the Fleet was subject to attack by its own aircraft during manœuvres, and started to consider the problem more thoroughly than it had before. Wide divergence of opinion on this question between ships and aircraft had always existed, but only now became apparent. Personnel of the aircraft were certain of success; they approached, they explained, to a distance where they could see the whites of the eyes of the target ship's company, and saw little chance of missing her. On the other hand the gun crews on board the ships were equally certain of shooting them down long before they dropped their torpedoes. Accordingly a valuable liaison between the two was begun: for example, if one flight of torpedo aircraft was scheduled to attack a particular ship, personnel of another flight were sent on board to watch the handling of her anti-aircraft guns. There was a tendency at this time to employ large numbers of aircraft in searching for submarines, but they hardly ever saw them, even though they knew almost exactly where they were. The problem of arrester gear, which had worried the Argus, was solved by abolishing it altogether.

By this time our Navy became very behindhand in the installation of catapults, not due to lack of inventive power but to lack of money. Both the Americans and ourselves had produced an air-operated catapult which at least worked. The Americans installed this type in all ships capable of carrying it, whereas we fitted it only in one or two ships. The reason for this was that it was obvious at that time to all countries that cordite-operated catapults would soon come into use, and until they did we could not bear the expense of installing a type with all its attendant disadvantages. It had to have a large air-compressing plant, it had an uneven stroke, and was soon to become obsolete. Meantime the Americans, who had the money to instal it, gained valuable experience in placing their catapults, and above all in the employment of the aircraft launched from them. It is interesting to note the trend of opinion of other chief naval powers at this stage of development. Japan adopted much the same system as ourselves, but America favoured a far greater proportion of attacking aircraft, particularly Fighters, than we did—they hardly developed long-distance reconnaissance at all,



THE VICKERS-SUPERMARINE "WALRUS" AMPHIBIAN FLYING-BOAT.

Entering hangar in H.M.S. Sheffield.

(By courtesy of the Supermarine Aviation Works and Fox Photos.)

preferring to rely on shore-based flying-boats. America's view was that there was only one way to sink a fleet, and that was by big guns; they proposed to do this by shooting down aircraft likely to interfere with them.

Although all countries began to develop and practise their anti-aircraft armament no one could forecast what effect it was likely to have.

SITUATION AT THE PRESENT TIME.

Fresh improvements and difficulties have occurred in the Fleet Air Arm since 1925.

There is now an efficient type of arrester gear for landing aircraft and a form of catapult to send them off, both of which allow for more variation in the course and speed of a carrier relative to the wind. The days when aircraft carriers found themselves steaming at high speed through the enemy fleet are over. These ships used to work independently, each interpreting the Commander-in-Chief's wishes as best she could; now they can work together under the command of a Flag Officer, and their movements and operations are controlled as one unit. Night flying is usual, although the purposes to which aircraft can be put when they are flying at night over the sea have not yet been determined.

A new duty has been laid upon the Fleet Air Arm—that of protection of the Fleet from hostile air attack. Reconnaissance aircraft can be and are sent out from the Fleet in every direction, and a force of fighters maintained over it to deal with aircraft on their way in to attack. Unfortunately it is very difficult to see one aircraft from another, and this form of operation is liable to appear more successful than it really is. Occasions when aircraft do sight each other are brought into prominence in reports of exercises, but instances where large bodies of aircraft must have passed close to each other without sighting are not mentioned—perhaps because they are not definitely known.

New types of aircraft have been introduced. At one time there were four types—a four-seater for spotting, a three-seater for reconnaissance, and single-seater types both for torpedo dropping and fighting. Now we have the torpedo-spotter-reconnaissance aircraft forming the main bulk, and a two-seater fighter for supplementing it. It is no doubt efficient in some ways to have one aircraft capable of so many duties, but it may make for inefficiency in other ways. An aircraft crew which formerly specialised in one duty must now be prepared to perform three. It is said that "specialisation is a necessary product of development." The Fleet Air Arm is departing—is being forced away—from this principle. Moreover, this difficulty is being accentuated by shortage of personnel. The Royal Air Force, the Fleet Air Arm, indeed, any flying service suffers from the fact that those who fly must be comparatively young, and their employment and their avenue of promotion as they grow older is an inherent problem. The Royal Air Force has attempted to solve the difficulty by introducing short-service officers and ranker pilots ; the Admiralty has adopted the system of observer ratings, and is considering others.

There must be apprehension that with increasing duties and personnel with less training to perform them, there may be a falling-off in efficiency.

Finally there has been little increase in the range of air reconnaissance during the last few years, due chiefly to caution in exposing the lives of personnel. Aircraft used to be made of wood and floated if they were forced into the sea, and flying from the Fleet was recognised as a dangerous practice from which risks were inseparable and to be expected. Now aircraft are made of metal and may sink at once, although all possible provisions are made for the safety of the crews. Also after a service has been in being for a number of years it is right and inevitable that increased precautions should be taken for the safety of those engaged in it. The question of bombing is discussed later in this article.

SHORE-BASED AIRCRAFT.

It is impossible to give figures showing the expansion of shore-based aircraft for naval purposes, because they can be diverted from one duty to another and have not been specialised.

SHIPPING ON THE OCEAN ROUTES.

Shore-based aircraft cannot carry out any extensive patrol of the ocean routes, and probably they never will be able to. They can only patrol the fringes of the oceans. In order to carry out an efficient patrol the further they fly out the more aircraft are required. Similarly, the bigger they become the easier they are to see, and to hit. These are vicious circles which have to be faced.

For example, a shore base which wishes to carry out a patrol at a radius of 250 miles over an arc of 180 degrees must employ an enormous number of aircraft. An efficient patrol demands that aircraft should be no more than twice visibility distance apart at its outer edge. Taking the average visibility as 10 miles, aircraft at the outer end must be 20 miles apart. This means that about 40 aircraft must keep as near as they can to the circumference of this semi-circle. Not only that, but there must be another 40 aircraft flying out to relieve them and a further 40 homeward bound. If the aircraft work "watch and watch" there must be an additional 120 ashore, making a total of 240 aircraft engaged in the search. No commander would employ aircraft in this way unless a most valuable prize was expected.

The chief enemy of merchant shipping, the raiding cruiser, must show her presence from time to time, and it is then that she can be searched for by air look-outs followed by attacking aircraft, and followed in their turn by ships. The advent of aircraft tends to let everyone know where everyone else is, and this acts against the raiding cruiser. Indeed, the advent of aircraft makes ocean routes safer for merchant shipping than they used to be.

SHIPPING IN NARROW WATERS.

In such waters as the English Channel, the approach to Singapore, and even in the Mediterranean Sea, there is no doubt that ships can be found by air patrol. Certainly in theory, and very probably in practice, aircraft can dominate merchant shipping in these waters, or at least can force them to divert their routes. Not only that, but whereas ships in their own harbours used to be safe from attack by the enemy, they are now open to it.

SPANISH CIVIL WAR.

No study of air warfare in narrow waters would be complete without an examination of wars at present in progress. The reports from China are still too indefinite to warrant conclusions being drawn from them, but there is a wealth of information from Spain.

Two fleets started the war somewhat similar in strength, and no warship on either side has been sunk by aircraft; on the other hand, only one aircraft has been brought down by a ship.

There has been remarkably little air effort devoted to the navies of either side, and it is interesting to examine the cause of this. There are various reasons which can be put forward. The aircraft used were in the case of the foreign air forces modern, but they were not equipped either with the sights, the training, or the practice to bomb ships. The Government fleet retired to Cartagena soon after the war started, and has hardly ever emerged. It may not have been worth damaging. The Nationalist fleet has lain off the coast of Spain for weeks controlling shipping and doing much damage to the Government cause; it seems extraordinary that it has not been attacked more often. The theory has been advanced that both parties were reluctant to attack ships which would eventually belong to them if they were victorious. The real reason seems to be that aircraft showed a curious timidity to attack any targets with anti-aircraft armament, however inefficient; and if they did attack were frightened, flew high, and were therefore inaccurate.

Although at least six merchant ships have been sunk and many more damaged, there is no doubt that unsuccessful attacks far exceeded those which were successful. On occasions, as many as thirty or forty bombs have been aimed at a merchant ship without any of them hitting her. These ships have usually been slow and invariably defenceless; aircraft could come as low as they liked; and it is surprising how many targets escaped injury. Some ships claim to have avoided attack by continuous alteration of course, but this is probably untrue. Other ships escaped which never altered course at all, and it is justifiable to assume that a merchant ship putting her wheel hard over will so reduce her speed as to render her an easier target for further attacks. Other aspects of the Spanish civil war are also of interest. For example, there was much the same success (or failure) in attacks on big ships as on small ones. On many occasions aircraft attacked ships which they did not intend to attack, due to faulty navigation or ship recognition or both. It has been fortunate for both sides that these mistaken attacks have resulted in so little damage, and one may well imagine the danger of bombing allied or neutral ships in a first-class war.

On the whole attacks were more successful upon ships in harbour than at sea, and until bombing becomes accurate this will probably always be the case. If you miss a ship at sea you do no damage, but if you miss a ship alongside the dockyard wall you will probably hit and damage something else.

Another advantage of attacking ships in port is the demoralising effect which bombing has upon the men on the dockside, who load and unload cargoes. This was noticeable in the Spanish War, particularly at Malaga, which had withstood some forty air raids before it fell to the Nationalists. Ships were held up often for days and sometimes for weeks due to lack of loading facilities.

The morale of ships attacked has been greatly lowered by air action: crews have refused to sail and captains have sometimes even put their ships ashore in fear of the air menace. The question has for some years been under consideration as to whether aircraft can control shipping, and the present writer for one felt fairly convinced that they could not. In the Spanish war, however, two merchant-ships have been forced to an examination anchorage by the threat of aircraft attack.

Finally attacks on aerodromes, which used to be considered most unprofitable, have proved surprisingly successful, and many aircraft have been destroyed as a result of them.

"POLICING THE EMPIRE."

As aircraft increase in number and size it is for consideration to what extent they can replace ships in keeping order in the more remote and primitive parts of the Empire. It seems at first sight that they are ideal for this purpose: a tribe which misbehaves can be warned one day and raided the next, while its sins are still fresh in its memory; and aircraft are very much cheaper than ships. There are, however, disadvantages to this system, most of which are psychological. Aircraft cannot mete out justice, and their bombs may fall on the heads of devoted admirers of the British Empire; if they set alight crops or destroy villages they tend to increase the poverty which in most cases was the cause of the original trouble. Also they lack dignity and ceremony, which are very dear to the heart of sheiks and headmen of tribes, who like to be received on board with the customary salutes to which they are entitled; and only then will they be in a frame of mind to discuss their troubles and grievances. Although a flying-boat can land at their ports, it cannot conform to ceremonial procedure, and also while it is on the water it is defenceless and not held in awe.

Broadly speaking it may be said that a tribe which is at war with us or entirely hostile is best attacked by aircraft, but one over whom we have some control and whose loyalty we wish to retain is probably best pacified by the visit of a ship which can investigate the cause of the trouble, punish those responsible for it, and impress its ruler.

THE FUTURE.

It is a bold man who would forecast the future of Naval air forces, but it is at least possible to say which problems are clear and which are obscure. Fortunately it is unnecessary to look far ahead in the design of aircraft. The designer of a ship must consider all the eventualities which may take place during the years the ship is being built; she cannot be changed to any great extent once she has formed shape; she is so expensive and takes so long to build that she cannot easily be replaced. An aircraft is not very expensive; every two or three years it has to be reconditioned, which costs two-thirds of its original value; and it can then be replaced by a new type comparatively cheaply. In nine or ten years a type of aircraft becomes obsolete, and it is then possible to change one's mind entirely free of charge. Moreover, once we know what type of aircraft we do want it can be put into production very quickly.

At present we do not know exactly what we want, and some problems have yet to be solved—for example, we do not quite know the best method of attack upon ships by aircraft. It is convenient to show the advantages and disadvantages in tabular form. No attempt is made at its solution.

Method of Attack and Advantages.	Disadvantages.
Attack with high bombing aircraft. Only bombs dropped from heights over 10,000 ft. achieve sufficient speed to pierce the armoured deck of a ship and sink her. At this height aircraft are reasonably immune from anti-aircraft fire. They have a good chance of achieving complete surprise.	Experience has proved that high bombing aircraft hardly ever hit ships even in clear weather. Apart from this it would be wrong for aircraft to specialise in high bombing, because the sky is so very seldom clear and when it is not they must come down below the clouds and adopt a method of attack in which they are untrained and vulnerable.
Attack with torpedoes. They reduce the speed of ships so that our Fleet can catch up with them. They inflict under-water damage which necessitates docking. and months of time to repair.	Torpedo aircraft must come down close to the water and must be on a steady course as they release their weapons. They are easily shot down, and will become increasingly so as anti-aircraft develops.
Attack with dive-bombing aircraft. They may well achieve surprise. They are only within gun range for a few seconds and secure a large percentage of hits. They come down too fast for fighters to attack them. Their adoption in other countries has been successful.	An aircraft diving at 300 m.p.h. releasing its bomb from 2,000 ft. sends it downwards at the same speed as if it had been dropped level from 4,000 ft. It could not sink a ship, and the damage it caused would be as easily repaired as that caused by small shells; it would not even reduce a ship's speed.

As aircraft carriers become more important their safety is of increasing concern to the Commander-in-Chief, but it is still doubtful where they should operate relative to the Fleet. The opposing views run much as follows :

Keep them close to the Fleet, and near the protection of its anti-aircraft guns, but they will be under the direct orders of the Commander-in-Chief, and can be provided with a special force to protect them if necessary.	The aircraft carriers are the target of enemy aircraft. If they are with the Fleet they will be found, and if found they will either be destroyed or at least rendered unable to operate aircraft.
Keep them far from the Fleet—thirty or forty miles away—their only chance of survival from air attack is evasion. They can defend themselves from surface attack by means of their own air lookouts and by their own speed.	Enemy aircraft would probably find them in any case. If they could not their own returning aircraft might well miss them too. There would be a serious loss of flying time if aircraft had to travel such a distance to and from the Fleet before they started and ended their duties.

FUTURE DEVELOPMENT.

Naval air warfare may be altered by the introduction of new types of air and surface craft.

For example, it has been due more to public opinion than to scientific opinion that airship construction has stopped in this country. Most of our airship failures, paradoxically enough, have been due to over-eagerness for their safety. They were too rigidly constructed, they were equipped with diesel engines too heavy for them, and they weighed far too much. They were too safe to fly. The Graf Zeppelin, lightly constructed, has been so successful that we never hear of her, and until recently she continued her trans-Atlantic flights regularly and to schedule. Airships are fundamentally sound and safe ; engine failure does not bring them down and there is no limitation to the size they can attain. They may operate their own aircraft, and play a part not only in commerce but in war at present quite unsuspected.

Surface ships may be produced which can combine the facilities of a carrier for operating aircraft with the offensive power of a battleship.

All this is visionary, and is only included to indicate the changes which may take place.

There are some assumptions which we can make ; one of them is that the human frame and the human eye will remain much as it is at present.

A lesson which emerges clearly is the necessity for efficient air lookouts. This may seem a platitude, but the results of the Spanish War go to emphasise it so much that it becomes almost a discovery. German anti-aircraft batteries ashore owed their outstanding success partly to the care with which they trained and organised their look-outs. In the case of ships, the morale of their crews was largely dependent on their ability to sight aircraft early. When, as sometimes happened, bombs struck a ship unexpectedly, the demoralising effect was out of proportion to the damage inflicted, and much greater than when some warning had been received. It may be expected that ships, unable either to work sound locators or to rely on any other form of warning, will increase the number of look-outs, shorten their tricks, and train them more intensively than at present.

Submarines always have been and always will be very difficult to see from the air; it may be useful to keep a look-out for them on the surface ahead of a fleet or convoy, but it is a misuse of aircraft to attempt to search for them submerged.

Aircraft sight each other in the air chiefly by luck, and aircraft cannot be considered as an efficient defence against other aircraft whose position they do not know.

Aircraft can only alight upon a ship at night which is lighted in some way, and the light cannot be concealed from hostile ships and aircraft in the vicinity. Besides, if they do get into the air they cannot see much. It is, however, possible that ship-borne aircraft might be able to shadow throughout a night an escaping fleet which had neither time nor the opportunity to attack the ships carrying them.

GENERAL CONCLUSIONS.

In summing up the broad problems arising out of the introduction of aircraft, and of their subsequent expansion, it is safe to say that trade upon the oceans benefits, but in its harbours it is increasingly menaced by aircraft.

The cruising fleet must defend itself with its own anti-aircraft armament, and this it can probably do fairly efficiently. When ships are obliged to steam and fight within easy reach of hostile aircraft the results are almost impossible to determine without the experience of a major war.

We can learn something from the Spanish Civil War. We can realise how frightened aircraft were of ships and ships of aircraft. As we have seen, neither did much damage to the other, and this fear was unjustified. When the Nationalist ships disregarded the air menace and blockaded the north coast they worked close to the shore, usually stopped or at slow speed, presenting perfect targets, yet they achieved their object. With better equipment on both sides the results may well prove similar.

In spite of technical development, scientific training, and brain strain, it seems that courage and determination play at least as great a part as ever in modern naval warfare.

OBSERVER.

CHAPTER XV.

THE BRITISH AND AMERICAN EXPERIMENTAL FLIGHTS ACROSS THE NORTH ATLANTIC DURING 1937.

The events leading up to the experimental flights across the North Atlantic were reviewed in "Brassey's Naval Annual" for 1937, and the various routes and methods of operating air services by means of flying-boats were discussed.

Following many years of investigation and organisation, the year 1937 saw the first experimental flights leading directly towards the establishment of a commercial service for the carriage of mail and ultimately of passengers as well. Imperial Airways' active negotiations in regard to air services across the North Atlantic may be said to have started in 1929, although preliminary discussions and explorations into this subject had been made for a number of years previously with interest increasing with the number of successful flights completed by pioneer adventurers.

The early negotiations may be said to have been consummated in 1937, when agreements were concluded between the Governments of the United Kingdom, Eire,* and Canada, and the United States for the operation of British and American air services between England and New York. During 1937 also, agreement was reached with the Portuguese Government for the use of the Azores, thus clearing the way for the use both of the "direct" route—England, Eire, Newfoundland, and Canada—and the "southern" route *via* Portugal, the Azores, and Bermuda.

The basis of the co-operation between the Governments of the United Kingdom, Canada, Eire, and Newfoundland has been public property since 1936, but seems worthy of recapitulation here as it illustrates the spirit of friendship in which the negotiations were conducted and concluded. Briefly the arrangement is that the British North Atlantic services shall be run by a joint operating company, to be formed at the instance of three companies, of which one will be nominated for the purpose by the Government of the United Kingdom, one each by the Governments of Eire and Canada respectively: until this joint operating company is formed, Imperial Airways shall undertake the operation of the experimental flights.

This, then, was the position when the programme was drawn up for the first experimental flights by British and American civil aircraft over the North Atlantic in 1937.

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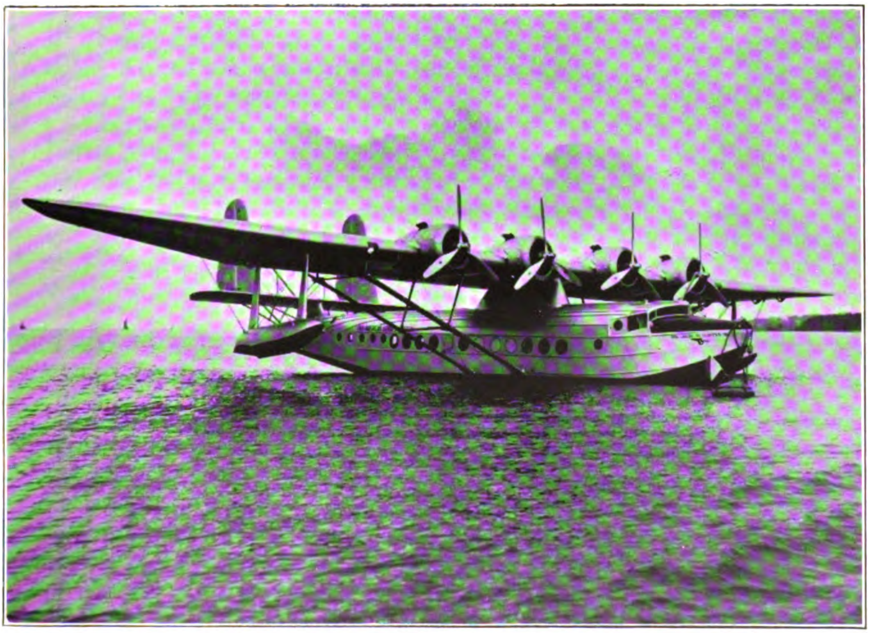
* As the Irish Free State is now officially designated under the new constitution.

THE IMPERIAL AIRWAYS FLYING-BOAT "CALEDONIA."

(By courtesy of "The Aeroplane" and Imperial Airways.)



THE PAN-AMERICAN AIRWAYS FLYING-BOAT "CLIPPER III."

("Flight," copyright photograph. By courtesy of Imperial Airways.)

ROUTES.

As was detailed in the 1937 " Brassey," the choice of route lies between three, of which the northern route appears at present to be impracticable—at any rate for a service to operate during a reasonable part of the year with a ground organisation that could be provided at a reasonable cost—in spite of the valuable information obtained by the two survey parties led by the late Gino Watkins to Greenland. The story of these two expeditions is one of great gallantry and fortitude, for which no praise can be too high. The vigil of Mr. Augustine Courtauld for six winter months in the meteorological station on the summit of the icecap will long be remembered.

Of the remaining two, the direct route is the one which appeals to British aviation. It has already been stated officially that all practicable preference will be given by the Governments of the United Kingdom, Eire, and Canada to the establishment of the trans-Atlantic air service by this route. This route needs to make use only of territory belonging to members of the British Commonwealth; it is also considerably shorter than the southern route, the figures from England to Montreal being 3,230 and 5,129 miles respectively. Owing, however, to the weather conditions on the direct route, it may be necessary to use the southern route in the winter.

The use by flying boats of the southern route depends upon the practicability of the Azores. One of the senior Captains of Imperial Airways is stationed at the present time in the Island of Fayal, Azores. His reports to date show that the prospects of the Azores being practicable for use by flying-boats are somewhat better than had previously been thought.

There is much to be said in favour of the route of the British North Atlantic service passing through the city of Montreal, whence the internal air lines of Canada will be able to distribute traffic brought from the Old World to the New. In view, however, of the reciprocal nature of the co-operation with the United States, it is important that the route should pass through Montreal and continue to New York as the terminus.

AIRCRAFT IN 1937.

The starting of experimental flights had naturally to wait upon the production of aircraft which were capable of flying non-stop not only *with* the prevailing wind over the distances required but also *against* it, and also upon the establishment of a radio and meteorological organisation that would render the flights normal commercial activities rather than heroic adventures.

In 1934 Imperial Airways had decided to employ flying-boats for the majority of their long-distance services, and had in consequence ordered a large number of four-engined flying-boats from Messrs. Short Brothers of Rochester. These flying-boats were designed for comparatively short-range operation, i.e. 500-mile stages, as the distances between stopping-places on the African and Australian routes fall conveniently within this range.

This type of short-range aircraft, if stripped of its passenger accommodation and fitted with additional tankage, is nevertheless capable of crossing the North Atlantic with a margin of fuel considered to be necessary, i.e. sufficient for a flight of 2,500 miles against a continuous headwind of 40 m.p.h. The distance from Ireland to Newfoundland is approximately 2,000 miles, and an adverse wind has almost invariably to be faced when flying in this direction.

Two of these new flying-boats—the Caledonia and the Cambria—were selected for temporary use for the experimental flights across the Atlantic. They will revert during the present winter, after reconversion to standard, to the duties on the Australian and African routes for which they were built. Pan-American Airways used a Sikorsky S.42.B flying-boat, known as the Clipper III. This aircraft also was one of their standard fleet and was also adapted for the experimental flights. The cruising speed in still air of the Caledonia and the Cambria on the trans-Atlantic crossings was approximately 150 miles an hour. The cruising speed of the Clipper III in still air appears to have been about 135 miles an hour. The Caledonia and the Cambria each carried a crew of four, consisting of a captain, a first officer, and two wireless operators; the Clipper III carried a crew of seven, consisting of a captain and four officers, a steward and an engineer.

THE PROGRAMME FOR 1937.

In view of the importance and the magnitude of the project, it was agreed that no attempt should be made during 1937 to run a regular service. It seemed better from every point of view to regard 1937 purely as an exploratory period in which flights would be made during the period of the best weather. The results and experience obtained in 1937 would be used in the shaping of the 1938 programme.

To avoid the undesirable competition that would arise from the natural desire to be first across, and to emphasise the co-operative basis of the experiment, it was further decided that the earlier flights in 1937 should be made simultaneously by the aircraft of the two companies. It was felt that after the earlier flights had been made simultaneously and to schedule by the aircraft of the two companies, the glare of publicity would be less intense and the reciprocal nature of the two services would be established; this turned out to be the case. It was noticeable that although the first few flights obtained a high degree of publicity, the later flights had less news value, and the amount of attention devoted to them by the Press of the world was greatly reduced.

As far as Imperial Airways was concerned, the programme for 1937 was based on a departure from England every fortnight.

The fact that there were two "C" class aircraft available made this comparatively easy to fulfil, and may account for the larger number of flights made by Imperial Airways' aircraft than by those of Pan-American Airways. Pan-American Airways also was unfortunately handicapped by a minor accident to their flying-boat operating the New York–Bermuda service, which necessitated their diverting the Clipper III temporarily to maintain that service.

GROUND ORGANISATION.

Before relating what actually occurred during the 1937 season, it seems desirable to give an outline of the ground organisation, the existence of which enabled these flights to be made. The consideration of this question had been in progress for a number of years; Newfoundland presented the most formidable problem, owing both to the prevalence of fog round its coasts and to the comparative lack of the desired facilities.

Newfoundland is famous, or perhaps one should say notorious, among sailors for the fog-banks which close in on it. It appears, however, that the bad name of Newfoundland for fog is partly due to the fact that the shipping routes run round its north and south coasts, which undoubtedly suffer severely from fog conditions. Across the centre of the island, however, there is a belt of country relatively free from fog. The port of Botwood is in the centre of the east coast, and is in this belt; it is some considerable way inland at the extremity of a long arm of sea, and does not appear to suffer seriously from fog conditions. Botwood was therefore chosen as the flying-boat base in Newfoundland. As it is a port, it has certain facilities, including electric light and power, and during the summer when it is free from ice it deals with a thriving trade, mainly connected with the paper industry.

Nevertheless, it was thought that it would be unwise to rely entirely on one organised alighting area, and a suitable alternative was sought. It was also decided to find if possible a site for an aerodrome, so that landplanes could be used. A suitable site for an aerodrome was found at Hatties Camp, which is in the centre of Newfoundland and lies on the main Newfoundland railway, and close to it there is a long and narrow lake known as Gander Lake, which has been found suitable as an alternative alighting area for flying-boats.

In Eire, as has been previously mentioned, the mouth of the Shannon was decided upon as being the most suitable western port of call after all alternatives had been considered. The flying-boats use the harbour at Foynes, where a small island gives protection and calm water. The broad mouth of the Shannon provides adequate space for take-off and alighting in any direction of the wind. For the landplanes, an aerodrome is being made at Kilconry on the north bank of the Shannon, and somewhat nearer Limerick than is Foynes.

At Montreal a strip of the river St. Lawrence at Boucherville was selected and the various sand-banks in the vicinity were specially buoyed. This area has proved entirely satisfactory to the captains of the flying-boats.

As the American experimental flights did not pass through Montreal on their way from New York to Newfoundland, facilities were provided by the Canadian Government at Shediac, in New Brunswick.

Southampton and New York both have flying-boat bases established for other purposes; Southampton is the base for Imperial Airways' flying-boats which are in regular use on the African and eastern routes; New York flying-boat base is in regular use by the aircraft, both British and American, operating the New York–Bermuda service.

After the various ports had been decided upon, attention was then directed to the provision of wireless stations. The most important wireless stations are clearly those situated at each end of the ocean crossing. Powerful stations were therefore established, one at Botwood and the other close to the aerodrome site at Kilconry. They are not only provided with medium and short-wave communication apparatus but also with medium and short-wave direction-finding equipment. The development of short-wave communication and direction-finding has made it possible to maintain contact with the aircraft during the whole passage across the Atlantic.

Additional stations were provided by the Canadian authorities along the St. Lawrence river and also at Shediac. From Montreal to New York the route is adequately covered by the Canadian and United States' airway network already provided for local air transport.

On this side of the Atlantic the Air Ministry and Southampton were connected by wireless with the Irish station on the Shannon; in these ways the whole route was covered from end to end.

The reporting and forecasting of weather conditions over the Atlantic are matters of the greatest importance for regular operation. The 1937 experimental flights proved that the meteorological organisation was extremely efficient in spite of the limited time during which it has been dealing with that particular route from an aviation point of view. Comprehensive meteorological stations were set up at the Shannon air port and also at Botwood, the former being staffed by technical experts of Eire and by members of the Air Ministry meteorological section.

It is perhaps worthy of comment that a meteorologist from the British Air Ministry has been travelling continuously to and fro across the Atlantic by steamer during 1937 to obtain data which were wanted, and which cannot be obtained from ships unprovided with the trained staff and the necessary special apparatus.

In Newfoundland the meteorological station is staffed by the Canadian meteorological service. For some months before the start of the experimental flights Imperial Airways had been making regular daily meteorological flights in Newfoundland, using an aircraft and instruments provided by the Air Ministry and the Canadian meteorological service respectively. These flights collected important data on upper wind directions and strength and helped in the establishment of the efficient meteorological service that has been built up.

In addition to this, certain selected ships on the North Atlantic provided regular weather reports which were used in the compilation of weather charts.

NARRATIVE OF EVENTS.

The actual flights made during 1937 are set out for easy reference in the tables on the following pages.

The first six flights were made simultaneously by the aircraft of the two companies and at night. The departure in each case was made before darkness fell and the arrival was made after dawn had broken; but the greater part of the flight was made during the hours of darkness. There are several advantages in flying the ocean stage by night, among them the fact that wireless communication is, generally speaking, easier at night, and navigation by sights on stars is more accurate than by sights on the sun only. It seems inevitable that the ocean stage will have to be flown by night when the service carries commercial traffic, in order to reduce the overall time from one terminus to the other.

To gain experience of day-time crossing, however, three westward flights by day were made during the series, the first by the Clipper III and one each by the Caledonia and the Cambria. It was not considered desirable to make flights by day in the eastward direction, as flight in an eastward direction has the result of reducing the amount of daylight available, and either departure or arrival in the dark would have been almost inevitable. In a westward direction, flying with the sun, there is an increase in daylight available if you start in the morning, or of night if you start in the evening.

It is beyond the scope of this article to give a detailed account of each individual flight; but Captain Wilcockson's report of the first crossing will doubtless prove of interest; it is as follows :—

> We slipped moorings at 18.42 G.M.T. It was raining, with low cloud and a fresh westerly wind of 30 m.p.h. approximately, causing an appreciable chop on the river. We taxied round the western end of Foynes Island and took off diagonally across the river. The take-off was good and I put the aircraft direct on course for Loop Head and Botwood. We passed Loop Head at 19.14 G.M.T., flying at 500 feet in moderate rain. Conditions remained like this until 19.30 G.M.T., when the cloud got lower and rain increased. We came down to 200 feet, but were still in 7/10 of cloud. At 20.00 G.M.T. cloud had lifted to 800 feet and we were flying at approximately 500 feet below cloud, but it was still raining.
>
> The weather showed signs of improvement and we had an occasional glimpse of the sky. We climbed to 1,000 feet. The weather forecast for 18.00 G.M.T. was received at 21.00. The position was unchanged but winds might be a little lighter than expected. This was a reassuring report, as we were already making quite good progress.
>
> We sighted a ship on our port beam about 3 to 5 miles away and we were hoping we could get a fix from his position. We were, however, unable to get in touch and

Operating Company and Name of Aircraft.	Date of Atlantic Crossing.	Route Taken.	Time taken for Atlantic Crossing and Average Speed over the Ground.
1. Imperial Airways Caledonia.	July 5/6 (night)	Southampton Foynes Botwood Montreal New York	15 hrs. 26 mins. Foynes–Botwood; 131 m.p.h.
2. Pan-American Airways Clipper III.	July 5/6 (night)	New York Shediac Botwood Foynes Southampton	12 hrs. 34 mins. Botwood–Foynes; 157 m.p.h.
3. Imperial Airways Caledonia.	July 15/16 (night)	New York Montreal Botwood Foynes Southampton	12 hrs. 15 mins. Botwood–Foynes; 164·5 m.p.h.
4. Pan-American Airways Clipper III.	July 15/16 (night)	Southampton Foynes Botwood Shediac New York	16 hrs. 20 mins. Foynes–Botwood; 122 m.p.h.
5. Imperial Airways Cambria.	July 29/30 (night)	Southampton Foynes Botwood Montreal New York	17 hrs. 45 mins. Foynes–Botwood; 114 m.p.h.
6. Pan-American Airways Clipper III.	July 29/30 (night)	New York Shediac Botwood Foynes Southampton	12 hrs. 40 mins. Botwood–Foynes; 156 m.p.h.
7. Pan-American Airways Clipper III.	August 6	Southampton Foynes Botwood Shediac New York	18 hrs. 26 mins. Foynes–Botwood; 108 m.p.h.
8. Imperial Airways Cambria.	August 8/9 (night)	New York Montreal Botwood Foynes Southampton.	12 hrs. 6 mins. Botwood–Foynes; 167 m.p.h.
9. Imperial Airways Caledonia.	August 15	Southampton Foynes Botwood Montreal New York	16 hrs. 44 mins. Foynes–Botwood; 120·6 m.p.h.

Operating Company and Name of aircraft.	Date of Atlantic Crossing,	Route Taken.	Time taken for Atlantic Crossing; and Average Speed over the Ground.
10. Pan-American Airways Clipper III.	Bermuda–Azores August 17/18 (night)	New York Bermuda Azores Lisbon Marseilles Southampton	15 hrs. 31 mins. Bermuda–Azores; 132·8 m.p.h.
11. Imperial Airways Caledonia.	August 20/21 (night)	New York Montreal Botwood Foynes Southampton	11 hrs. 33 mins. Botwood–Foynes; 175 m.p.h.
12. Imperial Airways Cambria.	August 27	Southampton Foynes Botwood Montreal New York	14 hrs. 21 mins. Foynes–Botwood; 140 m.p.h.
13. Pan-American Airways Clipper III.	Azores–Bermuda Sept. 1/2 (night)	Southampton Merseilles Lisbon Azores Bermuda New York	15 hrs. 50 mins. Azores–Bermuda; 130·1 m.p.h.
14. Imperial Airways Caledonia.	Sept. 13/14 (night)	Southampton Foynes Botwood Montreal New York	15 hrs. 33 mins. Foynes–Botwood; 130 m.p.h.
15. Imperial Airways Caledonia.	Sept. 23/24 (night)	New York Montreal Botwood Foynes Southampton	11 hrs. 38 mins. Botwood–Foynes; 173 m.p.h.
16. Imperial Airways Cambria.	Sept. 27/28 (night)	Montreal Botwood Foynes Southampton	10 hrs. 36 mins. Botwood–Foynes; 191 m.p.h.
17. Imperial Airways Caledonia.	Lisbon–Azores October 7	Southampton Lisbon Azores	7 hrs. 21 mins. Lisbon – Azores; 142·4 m.p.h.
18. Imperial Airways Caledonia.	Azores–Lisbon October 10	Azores Lisbon Southampton	6 hrs. 49 mins. Azores – Lisbon; 154 m.p.h.

I did not wish to circle round him. The weather had not improved, as we expected, and rain again started.

At 21.20, we contacted S.S. New York City and obtained her position and a bearing of 224°. We were now in an estimated position 52° 36′ N. 17°, 55′ W.

We had been receiving regular bearings from the Shannon wireless stations, which indicated we were running very slightly to the south of our track and we had made the necessary alteration to our course. It was now too dark to get any more drift sights and at 22.30 G.M.T. we were in an estimated position 51° 37′ N., 20° 00′ W., and darkness was practically complete.

At approximately 23.05 we made wireless contact with the s.s. Alaunia, who was in position 52° 47′ N., 20′ 55° W., a position which was ideal for us. We asked him for bearings and used our own direction loop for about 20 minutes, his bearings falling in very accurately with our estimated positions and ground speed, and our position at 23.30 G.M.T. was 51° 48′ N., 22′ 00° W. This position could be accepted as quite accurate.

Five minutes after midnight we sighted a ship's lights on our starboard beam. This seemed a good opportunity of a definite check on our navigation, but once again we were disappointed and unable to make contact. It seemed strange that of the numerous ships we worked, we were unable to work the two actually sighted. They may have been foreign vessels or merely those on restricted watch.

At 00.35 we received our first bearing from Botwood, giving 067° with the short-wave direction finder. Just previously we had received a bearing from Foynes, giving 270°, also on short-wave.

At 01.00 we contacted and worked s.s. Beaverdale in position 53° 32′ N., 26° 18′ W., his loop bearings falling in very accurately with our estimated positions.

S.S. Black Hawk, in position 50° 26′ N., 25° 27′ W. and on a course of 266 degrees, came in very well, and loop bearings again fitted in with our previous navigation. It will be seen that these numerous position lines obtained from ships enabled us to have actual expected positions of extreme accuracy, and at 01.43 a transferred position from s.s. Beaverdale used with that obtained from the Black Hawk gave us a fix slightly to south of our Rhumb line track, but accurate as to ground speed.

The weather still showed no signs of breaking and at 02.20 it was raining, the sky being completely covered with cloud and pitch black. We were now in an estimated position of 51° 08′ N., 32° 13′ W. at 02.45.

Fifteen minutes later we made contact with the Empress of Britain, whose position at 03.00 was 53° 41′ N., 36° 04′ W. We had loop bearings of her which, though showing signs of slight night effect, gave us a very good cut. Our estimated position for 03.15 was 51° 05′ N., 33° 50′ W.

At 03.26 the clouds broke and we were able to take a star sight on Jupiter and Arcturus. There were two sextants on board, and my First Officer and I were able to get a star each. The fix obtained put us in 50° 32′ N., 34° 50′ W. This showed us approximately 33 miles south of our track and ground speed approximately correct.

Continuous slight rain was encountered at 04.40, the sky being completely covered with cloud and still dark. At 05.00 estimated position was 50° 42′ N., 39° 50′ W. At 05.06 we were flying in fog or cloud at 2,000 feet. This continued until 06.45, when we came out over the fog at 2,500 feet and saw the sun rise over the cloud layer.

Conditions were ideal now for flying. The sky showed no trace of cloud and the sun was shining brilliantly. Weather reports from Botwood showed clear sky, little wind, and no fog so that it only meant waiting for the fog to break.

We were unable to work Cape Race or Belle Isle D.F. stations due to bad atmospherics. This was most disappointing, as we were relying on these stations for an accurate fix up to 200 or 300 miles.

At 08.05 the fog started to clear and we were flying in ideal conditions. Our expected time of arrival at Botwood was 10.00 G.M.T. We sighted two icebergs at 08.30 and reported their position.

At 08.30 we received a bearing of 61° from Botwood; the previous bearing had been 069° at 08.05. At 08.40 I altered course to come in on a bearing of 65° from Botwood, and at 08.56 received a bearing of 66°, showing that we were on the correct track to make our landfall at Funk Island.

At 09.10 I asked for another bearing, as I had reckoned on passing Funk Island at 09.00. The bearing now given me was 74° or some way south of Funk Island. I asked for another and received 73°. I altered course on these bearings at 09.12 and passed mainland at Cobblers Island at 09.27, not having seen Funk Island. The medium-wave direction finding equipment at Botwood is of the Bellini Tosi type, not Adcock. The bearings therefore around 66° were in error, due to dawn effect, and my alteration of course put me south of my track.

> At 09.40 to 09.55 I received a succession of meteorological reports from Botwood, and arrived there at 10.02, or two minutes behind my estimated time of arrival.

The first simultaneous flights (numbers 1 and 2 in the table) were noticeable for the attention given them by Government and local authorities in the various countries concerned, and also by the general public. Mr. de Valera watched the departure of the Caledonia and the arrival of the Clipper III at the Shannon airport, and wished the crews of both aircraft good luck and welcome.

In Newfoundland the Governor inspected the Clipper III before her departure and the Caledonia on her arrival. In Montreal the Caledonia received a tempestuous welcome, the ships in the river being dressed with flags and sounding their sirens. Captain Wilcockson and the members of his crew were escorted in decorated cars to the City Hall, where they were officially welcomed by the Mayor.

In New York the Caledonia was welcomed by the President of Pan-American Airways, Mr. J. Trippe, and by members of the staff of the British Embassy.

The enthusiastic welcome of Canada was further emphasised by a request from the Canadian Minister of Transport that either the Caledonia or the Cambria should make a tour of cities in Ontario. It was, therefore, arranged that the Cambria, after her westward flight at the end of August (number 12), should visit Ottawa, Toronto, Hamilton, and Windsor before returning to England. This tour was duly carried out, but was somewhat delayed at Toronto by damage to one wing-tip float through striking a piece of floating debris while the aircraft was alighting on Lake Ontario.

During flight number 9, on August 15, the Caledonia experienced bad weather with high winds which her captain described thus :—

> The weather encountered on the crossing was worse than expected, as we ran from 07.00 to 16.00 with low cloud, fog, and continuous rain for practically the whole of 9 hours' flying. Wind speed must have averaged at least 35 knots from 08.00 to 16.00 G.M.T.

On the return flight (number 11), the Caledonia reported ice formation. The relevant paragraphs of her log are :—

> At midnight we were flying at 16,000 feet, just over the clouds but occasionally passing through them. Ice was forming on the wind-screen and propellers, being thrown off the latter and crashing against the hull.
>
> At 00.30 we were still at 16,000 feet. Static was bad, making 600-metre work impossible and I decided it was impossible to continue at this altitude as we were not really clear of cloud even at this height. At 00.50 we were descending in complete cloud and heavy hail showers; ice appeared to be increasing. At 01.25 we were below a complete cloud layer with almost complete cloud below. Conditions coming down had been abnormally bad owing to the very heavy vertical currents.

The aircraft used for these experimental flights were fitted with automatic pilots, which were normally in action for the greater part of the crossing. Not only does this equipment reduce the physical strain of flying to a considerable degree, but it also enables the captain and the first officer to concentrate on their navigation problems and on the consideration of the information, both meteorological and otherwise, which is supplied to them from the shore wireless stations. It was arranged that during each flight certain ships which were known to be in the Atlantic at that time should keep watch and co-operate with the aircraft. These ships were able to give the aircraft not only their own position but in several cases the bearing of the aircraft from them. The regular use of ships as part of the organisation of oceanic aerial navigation is likely to be continued and worked into the permanent scheme of ground organisation.

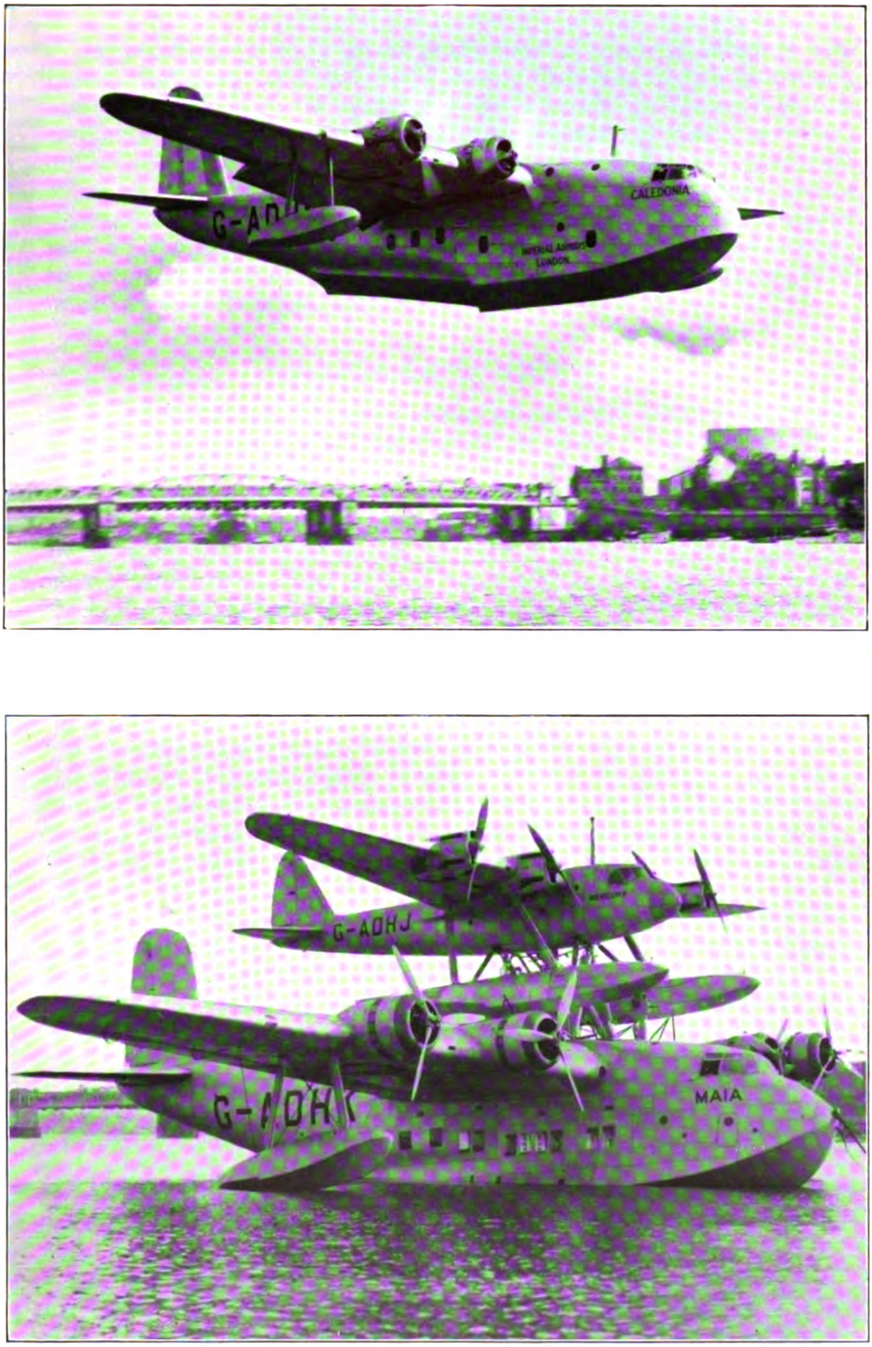
As an example of the accuracy obtained by the meteorological organisation, the following quotation from Captain Powell's report of his westward crossing on August 27 (flight number 16) is notable :—

> Drift after 2 hours' flying was 14 degrees to starboard. At 07.30 we entered frontal conditions with the sky completely covered with cloud at 800 feet, visibility becoming nil in heavy rain. Drift at this time was 16 degrees to starboard with very rough flying conditions. At 08.20, at almost precisely the precomputed point, we encountered the wind shift and within a matter of seconds our drift changed to 15 degrees to port.

The first few flights were made in comparatively slow time from terminus to terminus, but after a certain amount of experience had been gained it was thought that a decrease in overall time might be scheduled with advantage. The Caledonia made the fastest journey between termini of the whole series of the experimental flights in 1937. Captain Wilcockson took 46 hours 51 minutes, including all stops, for the flight from New York to Southampton. It is clear from these experimental flights that if a terminal time approaching 24 hours is to be obtained for regular services, there will either have to be a change of crews or else the size of the crew will have to be enlarged in order to provide sufficient rest for each individual member of the crew.

The flight of the Clipper III from New York to Southampton and back via the southern route proved interesting. The Clipper III was assisted by the wireless and meteorological systems on board the German catapult ship Schwabenland, which was at the Azores at the time as part of the ground organisation for the German seaplane flights which were being made along the southern route. The Schwabenland also assisted the Caledonia in the same way in her flights to and from the Azores in October (flights numbers 17 and 18).

As an instance of the disparity between the speed of shipping and of aircraft, the following incident may be quoted : the steamship Geraldine Mary left Botwood on August 17; before she left, her captain had agreed to keep a special wireless look-out for the Caledonia, which was due to make the eastward crossing on the night of the 20th/21st, i.e. three days later. The Caledonia duly left to schedule, established wireless contact with the Geraldine Mary after five hours' flying, and passed over the ship six and a half hours from the time of take-off at Botwood. As she passed over, the Caledonia switched on her search-lights and was informed by the Geraldine Mary that she had been sighted.



(TOP) THE IMPERIAL AIRWAYS FLYING-BOAT "CALEDONIA."

About to Alight with Flaps extended.

(BOTTOM) THE MAYO COMPOSITE AIRCRAFT.

(Photos by courtesy of Messrs. Short Brothers, Ltd., and "The Aeroplane.")

Apart from these items of particular interest, the story of the actual flights in 1937 is one of steady progress in efficiency and experience, both in navigation of the aircraft, in forecasting the probable weather conditions, in maintenance of radio services, and in the training of the ground organisation staff. As a result of these flights, confidence has been established. Their regular operation and the accuracy of wireless and meteorological services promises well for the next step in Atlantic operation, which we may expect to be the running of mail services to a regular schedule during the more favourable months of the year.

FUTURE DEVELOPMENTS.

It is not yet possible to see with certainty the way in which the North Atlantic service will ultimately develop. It is only possible to indicate the various methods which are being considered, any of which may be used.

There is, for instance, the fundamental question of whether flying-boats or landplanes will be used. Those in favour of landplanes advance as their main arguments the possibility of using them throughout the year on the direct route, when Newfoundland and Canada are ice-bound and cannot be used by flying-boats, and also the superior speed claimed for landplanes with retractable undercarriages as compared with flying-boats. The chances of a forced landing in a modern aircraft having at least four engines are somewhat remote, and they claim that no type of aircraft forced down in an Atlantic storm can be expected to survive. The Air Ministry has ordered two long-range four-engined landplanes from the De Havilland Company, one at least of which is expected to be flown by Imperial Airways with a view to experimental Atlantic flights in 1938.

Against this, one can argue that the Portuguese aviator Franco in 1929 rode out for five days a full Atlantic gale in a twin-engined Dornier Wal flying-boat. When his aircraft was picked up by H.M.S. Eagle it was found to be undamaged, although the captain of the Eagle had signalled that in his view no aircraft could live in such a sea. Moreover, the Atlantic is not always rough; a flying-boat could alight if it were in difficulties, and take off again under good weather conditions, whereas the landplane, unless specially designed to float, would be lost whether the sea were calm or rough. The flying-boat has an additional advantage over the landplane in that it does not necessarily have to find an aerodrome at the end of its journey, but can use any sheltered bay or water area of reasonable size.

It is interesting to note that both flying-boats and landplanes are under construction in the United States, with which it is understood trans-Atlantic crossings will be made. Flying-boats are being built by the well-known firms of Boeing and Martin, and are four-engined all-metal monoplanes of considerable size. There are also landplanes ordered from Boeing which are reported to be four-engined monoplanes specially equipped for high-altitude flying. The landplanes are reported to be considerably smaller than the flying-boats.

It does not appear that other countries, with the exception of Germany, are experimenting with methods of assisting the take-off of highly-loaded aircraft. In this country, on the other hand, there are three methods under active consideration, and in certain cases in an advanced stage of development. These three methods are :—

(*a*) the composite aircraft ;
(*b*) refuelling in the air ;
(*c*) catapults.

The composite aircraft has already received a considerable amount of publicity, and the underlying objects of the design are probably already well known. Briefly, the Mayo composite aircraft consists of a long-range seaplane which is assisted into the air by a flying boat on whose back it is carried ; at a suitable height the two components separate. The long-range component would be unable to take off by itself when carrying its commercial load in addition to sufficient fuel to make the Atlantic crossing. It may be worth mentioning that this aircraft as at present constructed is purely a large-scale experiment to test the principle and details of the scheme. It does not follow, because the upper component of the experimental composite aircraft is a seaplane and the lower component a flying-boat, that this is the only form in which the composite aircraft would be built or necessarily the form in which it would be built for regular oceanic services. Both components have already flown separately, and tests as one unit are expected to take place in the very near future.

The development of equipment and procedure for refuelling one aircraft from another in the air has been advanced during 1937. By this method it would be possible for an aircraft to take off with a small amount of fuel and a large percentage of payload, and when in the air receive from a tanker aircraft the remainder of the fuel required for a long-distance flight. If that fuel were to be on board before take-off, the aircraft would not be able to leave the water, but once in flight she can carry it. On arrival at her destination, so much of the fuel will have been consumed that the aircraft should be able to alight without difficulty. If it were necessary to alight before the fuel had been consumed, the surplus fuel could be dumped overboard through jettison valves provided for the purpose.

Catapults might take two forms, either a small type with high acceleration which could be carried in a ship, or a large type with low acceleration which would have to be set up on shore. The Deutsche Luft Hansa has used the former type of catapult for a number of years for its South America services and for the experimental flights which it has made across the North Atlantic. There is also considerable experience available from the naval catapults which have been used in the British Fleet for a number of years. For mail carriage there seems little objection to the small type of catapult, but it is doubtful whether it is suitable for passenger work because of its high acceleration. The comparatively slow acceleration of the large catapult fixed on shore has therefore a considerable attraction, but it is not yet known whether such a catapult could be used irrespective of the direction of the wind, although there are many plans to get over this difficulty.

In view of the diversity of opinion on the various methods of operating trans-Atlantic air services, continuous investigation into all possible methods seems to be the only reasonable plan at the present time. It may, and probably will, result in the use of various types of aircraft during the further experimental period, but it should result in the best solution being found for the last main link between the United Kingdom and one of the great Dominions, and for the operation of the route which has probably the greatest potential air traffic of any in the world.

H. BURCHALL.

REFERENCE SECTION

Comprising

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS

TABLES OF COMPARATIVE NAVAL STRENGTH

BRITISH AND FOREIGN AIRCRAFT TYPES

BRITISH AND FOREIGN ORDNANCE TABLES

MISCELLANEOUS

PROFILES OF BRITISH AND FOREIGN WARSHIPS

PLANS OF BRITISH AND FOREIGN WARSHIPS

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS

LIST OF BRITISH AND FOREIGN SHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.g.b.	Armoured gunboat.
g.b.	Gunboat.
b.	Battleship.
b.c.	Battle-cruiser.
l.cr.	Light cruiser.
c.d.s.	Coast-defence ship.
M.Cr.	Minelaying cruiser.
cr.	Cruiser.
A.A. or H.A.	Anti-aircraft guns.
A.C.	Aircraft carrier.
A.T.	Aircraft tender.
s.c.	Seaplane carrier.
H.N.S.	Harvey nickel steel.
H.S.	Harveyised or similar hard-faced steel.
K.S.	Krupp steel.
t.	Speed and H.P. at trials (in speed and H.P. columns).
b.p. or p.p.	Length of ship between perpendiculars.
L.	Light guns under 15 cwt., including boats' guns.
M.	Machine guns.

Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T.	Water-tube boilers, where the type is not known.
B.	Belleville.
Bl.	Blechynden.
B. & W.	Babcock and Wilcox.
D'A.	D'Allest.
My.	Myabara.
Nic.	Niclausse.
Pen.	Penhoet.
T.	Thornycroft.
T.S.	Thornycroft-Schulz.
Y.	Yarrow.

The following abbreviations distinguish types of machinery:—

P.T.	Parsons turbines.
C.T.	Curtis turbines.
B.C.T.	Brown-Curtis turbines.
(G.)	Geared turbines.
tur.	Turbines, where the type is not known.
recip.	Reciprocating engines.
I.C.	Internal combustion engines.

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (*i.e.* excluding fuel and reserve feed water).

GREAT BRITAIN.—Battleships and Battle Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Normal Draught.	Horse-Power. Type of Boilers.	Where Built.	Makers of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Complement (War).
												Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.		
																Heavy Guns.	Second-ary.				
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.	in.	in.	in.	in.			knots.	
b.	King George V.	35,000					Vickers-Walker	Vickers (Barrow) (G.)	Bdg.									*14-in.* guns.			
b.	Prince of Wales	35,000					Cammell Laird	Cammell Laird (G.)	Bdg.									*14-in.* guns.			
b.	Anson . .	35,000					J. Brown	J. Brown (G.)	Bdg.									*14-in.* guns.			
b.	Beatty . .	35,000					Fairfields	Fairfields (G.)										*14-in.* guns.			
b.	Jellicoe . .	35,000					Swan Hunter	Wallsend (G.)										*14-in.* guns.			
b	Barham. .	31,100	643¾	104 0	31 3	75,000 Y.	Clydeb'nk	J. Brown B.C.T.	1914	1915	2,470,113	13–4	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*; 5 M.; 11 L. 1 catapult, 1 aircraft	2 (sub.) 21″	25‖	1126
b.c.	Hood . .	42,100	860⅝	105 3	28 6	144,000	Clydeb'nk	J. Brown . B.C.T. (G.)	1918	1920	5,698,946	12–6	3–1	7–5	5–4	11	(*a*)	8 *15-in.*, 12 *5·5-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.*; 5 M.; 11 L.	4 a.w. 2 (sub.) 21″	31	1341
b	Malaya¶ .	31,100	640¾	104 0	31 3	75,000 B. & W.	Walker .	Wallsend . P.T.	1915	1916	2,945,709	13–6	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2 pr.*; 5 M.; 11 L.; 1 catapult, 1 aircraft.	2 (sub.) 21″	25‖	1136
b.	Nelson . .	33,500	710	106 0	30 0	45,000	N'wc'stle-on-Tyne	Wallsend . B.C.T. (G.)	1925	1927	6,410,071	14	6¼	..	..	16–9	..	9 *16-in.*, 12 *6-in.*, 6 *4·7-in.* A.A.; 4 *3-pr.*, 2 *2-pr.* mult. p.p., 2 *2-pr.*; 5 M.; 11 L.; 1 aircraft.	2 (sub.) 24″	23	1360
b.	Queen Elizabeth §	31,100	644¾	‡104 0	31 3	75,000 B. & W.	Portsm'th	Wallsend . P.T.	1913	1915	2,473,103	13–4	3–1	6	4–2	11	6	8 *15-in.*, 8 *6-in.*, 4 *3-pr.*, 8 *4-in.* A.A.; 5 M.; 11 L.	2 (sub.) 21″	25‖	1187

b.	**Ramillies** .	29,150	620½	‡102 0	29 0	40,000 Y.	Dalmuir .	Beard-more, P.T.	1916	1917	3,295,810	13–4	4–1	6	6–4	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L. (Resolution 5 *4-in.* A.A.) Resolution, Royal Oak, and Ramillies have a catapult on X turret and carry 1 aircraft.	2 (sub.) 21″	23‖	1010
b.	**Resolution**		620¼	‡101 4			Jarrow .	Palmer . P.T.	1915	1916	2,449,680										1012
b.	**Revenge** .		625¾	‡101 5			Barrow .	Vickers . P.T.	1915	1916	2,406,368										1104
b.	**Royal Oak**		620½	‡102 1			Devonp'rt	Hawthorn P.T.	1914	1916	2,468,269										1149
b.	**Royal Sovereign**		620¾	‡101 6			Portsm'th	Parsons . P.T.	1915	1916	2,570,504										1104
b.c.	**Renown*** .	32,000	794¼	102 4	31 0	112,000 B. & W.	Govan .	Fairfield . B.C.T.	1916	1916	3,117,204	9–3 K.C.	2	6–3	4–3	11–7 K.C.	6 K.C.	6 *15-in.*, 12 *4-in.*, 4 *3-pr.*, 8 *4-in.* A.A.; 5 M.; 11 L.; catapult and 4 aircraft in Repulse	2† (sub.) 21″	31·5‖	1188
b.c.	**Repulse*** .			102 6			Clydeb'nk	J. Brown . B.C.T.	1916	1916	2,829,087										1209
	Rodney . .	33,900	710	106 1	30 0	45,000	Birkenh'd	Cammell Laird B.C.T.(G.)	1925	1927	6,414,653	14	6¼	..	..	16	..	9 *16-in.*, 12 *6-in.*, 6 *4·7-in.* A.A.; 4 *3-pr.*; 2 *2-pr.*; 5 M.; 11 L.	2 (sub.) 24″	23	1315
b.	**Valiant** § .	31,100	639¾	104 ‡ 0	31 3	75,000 B. & W.	Govan .	Fairfield . B.C.T.	1914	1916	2,537,037	13–6	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L.; 1 catapult, 1 aircraft	2 (sub.) 21″	25‖	1136
b.	**Warspite** .	30,600	644½	104 ‡ 0	28 2	75,000 Y.	Devonp'rt	Hawthorn P.T.	1913	1915	2,518,360	13–6	3–1	6	4–2	11	6	8 *15-in.*, 8 *6-in.*, 4 *2-pr.*, 8 *4-in.* A.A.; 5 M.; 11 L.; 1 catapult, 1 aircraft.	2 (sub.) 21″	25‖	1130

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* Repulse reconstructed, 1936. Renown now in hand for modernisation, including re-engining.

¶ Built at the charge of the Federated Malay States.

§ In hand for reconstruction similar to Warspite.

† Repulse has 8 a.w. tubes in addition.

‖ Speed without bulges.

(*a*) Guns are in shields of 1-in. H.T. plating

‡ Over rubbers.

GREAT BRITAIN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Extreme breadth under water over rubbers.	Draught.	Horse-Power. Type of Boiler.	Where Built.	Maker of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
A.C.	Illustrious	22,000					Vickers (Barrow)	Vickers (Barrow)	Bldg							30 (about)	
A.C.	Victorious						Vickers (Walker)	Wallsend	Bldg.								
A.C.	Ark Royal	22,000	685 (b p.)	94 0	23 0	..	Cammell Laird	P.T.(G.)	1937	..	..	..	..	4·5 *in.* guns		..	..
A.C.	Formidable	22,600					Harland & Wolff (Belfast)	Harland & Wolff	Bldg.							30 (about)	
A.C.	Indomitable						Vickers-Armstrong Barrow	Vickers-Armstrong	Bldg.						—		
A.C.	Argus	14,450	567	75 9	21 0	20,000	Dalmuir	Beardmore P.T.	1917	1918	Purchased under construction	..	..	4 *3-pr.*, 4 M., 10 L., accommodates 20 aircraft	—	20·2	420
S.C.	Pegasus* (late Ark Royal)	6,900	366	50 10	17 6	3,000	Blyth	Blyth S. B. Co. recip.	1914	1914	do.	..	..	4 M., 10 L., 1 catapult	—	11	139
A.C.	Courageous	22,500	786¼	90 6 over rubbers	22 3	90,000 Y.	Walker† (Armstr'g)	Parsons P.T.(G.)	1916 As cruisers	1928 As aircraft carriers.	1,785,940 (a) 2,115,944 (b)	3	9–7	16 *4·7-in.*, 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 10 L.	—	30½	770
A.C.	Glorious						Belfast†	Harland & Wolff P.T.(G.)		1930	2,119,066 (a) 2,137,374 (b)	3	9–7				
A.C.	Eagle, *ex*-Almirante Cochrane.	22,600	667½	105 2	21 11	50,000 Y.	Walker (Armstrong)	J. Brown B.C.T.	1918 As a battleship.	1924 As an aircraft carrier.	4,211,576	..	..	9 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 32 smaller, 20 aircraft	—	24	753
A.C.	Furious	22,450	786½	90§ 1	21 6	90,000 Y.	Walker (Armstrong)	Wallsend Engn'g Co. B.C.T.(G.)	1916 As a cruiser.	1925 As an aircraft carrier.	2,436,603	3 —	7	10 *5·5-in.*, 3 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 46 smaller, 30 aircraft	—	31	728
A.C.	Hermes	10,850	600	70 3	18 7	40,000	Elswick	Parsons Co. P.T.(G.)	1919	1924	2,030,263‡	..	..	6 *5·5-in.*, 3 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 4 M., 16 L., 15 aircraft	—	25	551

* Used for experimental work. † Reconstructed as aircraft carriers at Devonport dockyard. ‡ Estimated cost including guns. § Over rubbers; 120 ft. over pallisades.

(a) First cost of ship as a cruiser. (b) Estimated cost of reconstruction as an aircraft carrier.

GREAT BRITAIN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Types of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Complement (War).
												Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
Dido Class	Dido	5,000					Cammell Laird		Bldg.								
	Euryalus						Chatham										
	Naiad						Hawthorn										
	Phoebe						Fairfield										
	Sirius						Portsmouth										
	Bonaventure						Scotts										
	Hermione						Stephens										
Improved South-ampton Class	Belfast	10,000					Harland & Wolffe	Harland & Wolffe	Bldg.								
	Edinburgh						Swan Hunter	Wallsend	Bldg.								
Fiji Class	Fiji	8,000					J. Brown		Bldg.					6-*in.*			
	Kenya						A. Stephen										
	Mauritius						Swan Hunter										
	Nigeria						Vickers-Armstrong (Walker)										
	Trinidad						Devonport Dockyard										
South-ampton Class	Southampton	9,000	595 584 on W.L.	61 8	17 0	75,000	J. Brown	Scotts	1936	1937	..	..	..	12 6-*in.*, 8 4-*in.* A.A., 2 smaller, 1 catapult, 3 aircraft	6	32	740
	Newcastle						Vickers, Tyne										
	Glasgow						Scotts										
	Sheffield						Vickers, Tyne										
	Birmingham						Devonport										
	Liverpool						Fairfield		1937	..							
	Manchester						Hawthorn										
	Gloucester						Devonport										
Arethusa Class	Galatea	5,200	506	51 0	13 10	64,000	Scott (Greenock)	Scott	1934	1935	..	..	..	6 6-*in.* guns, 4 4-*in.* A.A., 18 smaller, 1 catapult, 1 aircraft	2 T. 21″	32¼	500
	Arethusa						Chatham	Parsons									
	Penelope						Harland & Wolff	Harland & Wolff	1934	1935							
	Aurora						Portsmouth	Wallsend	1935	1937				4 4-*in.* twin mounting in Aurora and Penelope			

GREAT BRITAIN.—Cruisers—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
Leander Class	Ajax .	7,000	554½ o.a., 522 b.p.	55 8	16 0	72,000 P.T. (G.)	Barrow	Vickers .	1934	1935	..	..	..	8 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.* guns, 5 M.G., 12 smaller, 1 floatplane	2 Q. 21″	32½	570
	Achilles .	7,030					Birkenhead	Cammell Laird	1932	1933							
	Neptune .	7,000					Portsm'th	Parsons .	1933	1934	1,560,414	..	..				
	Orion .	7,070					Devonport	Vickers-Armstrongs	1932	1934	1,548,663	..	..				
	Leander .	7,140	..	55 2	..	..	Devonp'rt	Vickers-Armstrongs	1931	1933	1,667,819	..	..				
Modified Leander Class	Amphion	7,000	560	56 8	15 8	72,000	Portsm'th	Beardmore	1934	1936	..	..	..	8 *6-in.*, 4 *4-in.*, 21 smaller, 1 catapult, 2 aircraft	..	32½	590
	Apollo .						Devonport	Beardmore	1934	1936							
M.Cr. .	Adventure .	6,800	539	59 0	14 5	40,000 tur. and Diesel	Devonp'rt	Vickers .	1924	1927	1,246,083	..	..	4 *4·7-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms; 2 M., 8 L. 310 mines	—	27¾	395
Kent Class.	Berwick .	10,000	630	68 4	16 3	80,000 (G.) Y.	Govan	Fairfield .	1926	1928	2,029,526	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft Cumberland and Cornwall 6 *4-in.* A.A. and 3 aircraft.	2 Q. 21″	31½	700
	Cornwall .						Devonp'rt	Beardmore	1926	1928	1,252,110*	..	..				
	Cumberland						Barrow	Vickers .	1926	1928	2,960,821*	..	..				
Carlisle Class.	Cairo .	4200	451¾	43 10	14 1	40,000 (G.) Y.	Birkenhead	Cammell Laird .	1918	1919	787,479	3 / —	..	5 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.	8 a.w. 21″ (D.)	29	415
	Calcutta .						Barrow .	Vickers .	1918	1919	832,123						
	Capetown						Birkenhead	Cammell Laird .	1919	1922	1,984,720						
	Carlisle .						Govan .	Fairfield .	1918	1918	669,216						
	Colombo .						Govan .	Fairfield .	1918	1919	692,308						

* Total estimated cost of ship, including guns.

Caledon Class	**Caledon** .	4180	450 –450¼	43	1	14	1	40,000 P.T. (G.) Y.	Birken-head	Cammell Laird .	1916	1917	547,300	3/—	..	5 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.	8 a.w. 21″ (D.)	29	420
	Calypso .								Newcastle (Hawth'n)	Hawthorn Leslie	1917		529,190						
	Caradoc .								Green'ck	Scotts' .	1916		534,583						
Ceres Class	**Cardiff** .	4290	450 –450⅓	43	9	14	1	40,000 (G.) Y.	Govan .	Fairfield .	1917	1917	542,507	3/—	..	5 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms; 2 M., 8 L.	8 a.w. 21″ (D.)	29	430
	Ceres .								Clydebank	J. Brown .	1917	1917	529,248						
	Curacoa .								Pem-broke	Harland & Wolff	1917	1918	794,201						
	Curlew .	4290	450	43	9	14	1	40,000 (G.) Y.	Barrow .	Vickers .	1917	1917	544,436	3/—	..	10 *4-in.* A.A., 2 *3-pr.*, 2 multi M.G., 2 M.G., 8 Lewis	..	29	430
	Coventry .								Swan Hunter	Swan Hun-ter	1917	1918	586,182						
D Class	**Despatch** .	4850	471¼ –472¾	46 –46	3 9	14	3	40,000 (G.) Y.	Govan .	Fairfield .	1919	1922	1,016,870	3/—	Shields	6 *6-in.*, 3 *4-in.* A.A., 2 M., 4 *3-pr.*, 8 L., 2 *2-pr.* Pom Poms.	12 a.w. 21″ (T.)	29	460
	Diomede .								Barrow	Vickers	1919	1922							
	Danaë .								Elswick	Armstrong	1918	1918	701,600						
	Dauntless .								Jarrow .	Palmer .	1918	1918	750,025						
	Dragon .								Green'ck	Scotts' .	1917	1918	690,083						
	Delhi .								Elswick	Armstrong	1918	1919	785,145						
	Dunedin .								Elswick	H'wthorn	1918	1919							
	Durban .								Green'ck	Scott .	1919	1921	954,667						
London Class	**Devonshire** .	9850	630	66	0	17	0	80,000 P.T. (G.) Y.	Devonp'rt	Vickers	1927	1929	2,007,275	..	..	8 *8-in.*, 8 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 10 L., 1 aircraft, 1 catapult.	8 a.w. 21″ (Q.)	32¼	700
Norfolk Class	**Dorsetshire** .	9975	633	66	0	17	0	80,000 (G.)	Ports-mouth	Cammell Laird	1929	1930	2,101,951	..	..	8 *8-in.*, 8 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 10 L., 1 aircraft, 1 catapult.	8 21″ (Q.)	32¼	710

GREAT BRITAIN.—Cruisers, &c.—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
Improved Birmingham Class	**Effingham** . .	9770	605	65 2	17 3	65,000 (G.) Y.	Ports-mouth	Harland & Wolff	1921	1925	2,138,999	3 / —		9 *6-in.*, 3 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.*, 2 M., 8 L.	4 a.w. 1 sub.	30½	713
	Frobisher ‡ .	9860		65 1			Devon-port	Wallsend Eng. Co.	1920	1924	2,035,915†		Shields	6 *7·5-in.*, 2 *4-in.* A.A., 4 *3.-pr.*, 2 M., 8 L.	2 sub.	30½	715
E Class	**Enterprise** .	7580	570	54 9	16 6	80,000 B.C. (G.) Y.	Clyde-bank	John Brown	1919	1926	1,690,658*	3–1½ / 1	..	7 *6-in.*, 3 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L., 1 aircraft.	16 21" (Q.)	33	577
	Emerald . .	7550		54 7			Elswick	Armstrong	1920	1926	1,617,120						
York Class	**Exeter** . .	8390	575	58 0	17 0	80,000 (G.) Y.	Devonp'rt	Parsons .	1929	1931	1,837,415*	..	..	6 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 6 M., 8 L., 2 aircraft.	6 21"	32	630
Improved Birmingham Class	**Hawkins** ‡ .	9800	605	65 1	17 3	55,000 (G.) Y.	Chatham	Parsons Co.	1917	1919	1,599,741	3 / —	Shields	7 *7·5-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms; 2 M., 8 L.	4 a.w. 2 sub.	29½	747
Kent Class	**Kent** § . .	9850	630	68 5	16 8	80,000 (G.) Y.	Chatham	Hawthorn Leslie	1926	1928	2,084,213†	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms; 4 M., 8 L., 1 aircraft; London, 8 *4-in.* A.A.	8 21" (Q.)	31½	685
London Class	**London** . .	9850	630	66 0	17 0	80,000 P.T. (G.)	Ports-mouth	Fairfield .	1927	1929	2,029,949*	..	..			32¼	685
Norfolk Class	**Norfolk** . .	9925	638	66 0	17 0	80,000 (G.)	Fairfield	Fairfield .	1928	1930	2,141,961*	..	..	8 *8-in.*, 8 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 4 M., 10 L., 1 aircraft. 1 catapult.	8 21" (Q.)	32¼	685
London Class	**Shropshire** .	9830	633	66 0	17 0	80,000 (G.)	Dalmuir .	Beardmore	1928	1929	1,941,950†	..	..		8 21" a.w. (Q.)		
	Sussex . .	9830	633	66 0	17 0	80,000 (G.)	Hawthorn Leslie .	Hawthorn Leslie .	1928	1929	1,975,800†	..	..				

Kent Class.	**Suffolk** . .	10,000	630	68	5	16	3	80,000 (G.)	Portsmouth	Parsons .	1926	1928	2,180,240†	..	..	8	*8-in.*, 6 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L., 4 aircraft		31½	685
Improved Birmingham Class. .	**Vindictive** ‡ .	9996	605	65	2	17	3	60,000 (G.) Y.	Belfast	Harland & Wolff .	1918	1918	1,671,712	3/—	Shields	2	*4·7-in.*, 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.		30	720
York Class.	**York** . .	8250	575	57	0	17	0	80,000 P.T. (G.) Y.	Palmers'	Palmers' .	1928	1930	1,774,276	..	..	6	*8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft	6 21" (T.)	32¼	623

§ Undergoing Reconstruction. * Total estimated cost of ship, including guns. † Estimated cost, excluding armament and ordnance stores.
‡ Frobisher and Hawkins are being re-armed with 6-in. guns. Vindictive is de-militarised and employed as a cadets' training ship.

Patrol Boats.—P.C. 74, 610 tons, 20 knots, 1 4-in.; Dart (1918), 610 tons, 20 knots, 1 4-in., 2 12-pr.; P.59 (1917), P.40 (1916), Spey (1917), 560 tons, 20 knots, 1 4-in., 1 2-pr.; Kingfisher, Mallard & Puffin (1935–36), 510 tons, speed 20 knots, 1 4-in., 8 L.; Kittiwake, Sheldrake & Widgeon, 585 tons, 20 knots, 1 4-in., 8 L.

Training Ships and Gunnery Drill Ships (ex-Monitors).—Erebus, 7,200 tons; Marshal Soult, 6,400 tons.

Fishery Protection Gunboats (ex-trawlers).—Colne, Doon, Dee, Eden, Foyle, Garry, Kennet, Liffey, 490–550 tons, 11 knots, reciprocating machinery, 1 12-pr.

Destroyer Depôt Ships.—Greenwich (1916), 8,100 tons; Woolwich (1935), 8,750 tons, 15 knots, 4 4-in. A.A. Tyne, 1937 Programme.

Submarine Depôt Ships.—Lucia, 5,800 tons; Titania, 5,250 tons; Alecto, 985 tons; Cyclops, 11,300 tons; Medway (Vickers', 1929), displacement 14,650 tons, speed 15 knots, armament 2 4-in., 4 4-in. A.A. Maidstone, building. Forth, Building, 4 5-in. guns.

Repair Ships.—Resource (Vickers', 1930), displacement 12,300 tons, speed 15 knots, armament 4 4-in. A.A.

Minelayers (ex-Monitors), 1915.—Medea, 540 tons, 12 knots, 44 mines; Medusa, Melpomene, Minerva, 355 tons, 10 knots, 52 mines; (ex-trawlers) Vernon, 430 tons; Kate Lewis, 308 tons, 24 mines.

Surveying Vessels.—Beaufort, Fitzroy, Flinders, and Kellett, 800 tons, 16 knots, 1 3-pr.; Herald, and Iroquois, 1,650 tons, 15½ knots, 1 3-pr.; Endeavour, 1,280 tons, 13 knots, 1 3-pr.; Challenger (Chatham, 1931—originally intended as a fishery investigation vessel), 1,140 tons, 1,200 H.P. (recip.), 12½ knots; Franklin Jason & Scott, Building. See also under Sloops.

Non-magnetic Survey Vessel.—Research, building by Phillips at Dartmouth.

Netlayer and Target Towing Vessel.—Guardian (Chatham, 1931–3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A. Protector (1934 programme), 2,900 tons, 20 knots, 1 4-in.

Mining School (Vernon) Tender.—Nightingale (Portsmouth, 1931), Skylark (Portsmouth, 1932), displacement 275 tons, horse-power 400, speed 10 knots, coal capacity 15 tons.

Boom Defence Vessels.—Moorgate (Bow, McLachlan 1931), 345 tons, 1 4-in. gun; Bishopsgate (Henry Robb, 1932) and Aldgate (1934); Watergate (1934), 290 tons; Ludgate, Dowgate, Dunnet (1937), 350 tons, 1 3-in. 17 vessels building.

Tenders.—(For Submarine depot, Portland), Elfin (1933), 222 tons, 250 H.P., 9½ knots. (For Torpedo School) Redwing (1933), 225 tons, 250 H.P., 9½ knots.

Gunnery Training Ship.—Battleship Iron Duke has been de-militarised under the London Treaty and converted to a Gunnery Training Ship (1931–32).

Fleet Target Ship.—Centurion (ex-battleship), 25,500 tons.

Trawlers.—Basset (1935), 480 tons, 1 4-in. gun; James Ludford, Blackwater and Kennett (War built); Lilac, Laurel, Holly, Hawthorn, Cedar, Cypress, Sycamore, Syringa, Magnolia, Willow, Tourquaze, Topaze, Sapphire, Tourmaline, Jasper, Cornelian, Pearl, Ruby, Amethyst and Agate, purchased in 1935, 1 4-in. gun; Mascot 600 tons; Mastiff.

Special Service Vessels.—Plover 764 tons and Linnet 498 tons—tenders to Vernon; and Lassoo a tender to Osprey, building. Redstart, Ringdove (building).

Motor Torpedo Boats.—Twelve constructed by the British Power Boat Co., 1936-1937, 15 tons. Ten under construction.

Training Ship.—The liner Majestic was purchased 1936, and is being converted to a training ship and will be renamed Caledonia.

Auxiliaries.—Tugs, Drifters, Hospital Ship (Maine, 10,100 tons), Oilers, Store ships, etc.

Monitors.—Terror 7,200 tons, 12 knots, 2 15-in., 8 4-in., 2 3-in. A.A.

For sloops, minesweepers and river gunboats, see Flotilla tables, pp. 267–273.

Defence Forces of the Dominions.

ROYAL AUSTRALIAN NAVY.

Under Control of the Australian Naval Board.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Complement (War).
														Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		
		tons.	ft.	ft.	in.	ft.	in.						£	in.	in.			knots	
Kent Class Cruisers	Australia	9870	630	68	4	16	3	80,000 B.C. (G.) Y.	Brown Clydebank	Brown	1927	1928	..	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Pom, 4 M., 12 L., 1 aircraft.	8 21″ a.w. (Q.)	31½	685
	Canberra	9850																	
Amphion Class	Sydney	7000	530 b.p.	56	8	15	8		Wallsend	Wallsend	1934	1935				8 *6-in.*, 4 *4-in.* A.A., 21 smaller, 1 catapult, 1 aircraft	2 Q. 21″	32½	590
Adelaide Type Cruiser	Adelaide	5100	462½	50	1	15	10	25,000 P.T. Y.	Sydney	Sydney	1918	1922	..	3 —	..	9 *6-in.*, 1 *3-in.* A.A., 4 *3-pr.*, 10 L., 2 M.	2 (sub.) 21″	25·5	450
Seaplane Carrier	*Albatross	4800	443¾	61	0	15	6	12,000 P.T. (G.)	Cockatoo Island	Sydney	1928	1929	—	—	—	4 *4·7-in.* A.A., 4 *2-pr.* Pom Pom, 4 *3-pr.* 4 M., 20 L., 9 seaplanes.	—	21	350
Flotilla Leader	Stuart	1530	332½	31	9	12	3	40,000	Hebburn	Hawthorn Leslie	1918	1918	—	—	—	5 *4·7-in.*, 1 *3-in.* A.A., 7 M. & L.	6	36½	182

DESTROYERS.—"*V*" *Class*:—Vampire, Vendetta, Voyager, Waterhen. Completed, 1917–18; Displacement, 1,090 tons; 27,000 H.P.; speed, 34 knots; armament, four 4-in.; 6 smaller guns, 6 torpedo tubes.

SLOOPS.—Yarra (1935), 1060 tons, 2000 H.P. (T.G.), 16½ knots, 3 4-in., 13 smaller guns, and Swan, a repeat vessel (1936).

SURVEYING VESSEL: Moresby (late Silvio) (1918), 1650 tons, length 267½ ft., 2,500 H.P., 15 knots, one 3-pr.

DEPÔT AND FLEET REPAIR SHIP: Penguin (late Platypus) (J. Brown, Clydebank, 1917). Displacement 3,455 tons, 14 knots, 1 4-in.

* Used for gunnery instruction.

NEW ZEALAND DIVISION OF ROYAL NAVY.

Under the control of New Zealand Naval Board.

Training and Depot Ship.—Philomel (2570 tons); 1 6-in., 1 4-in., 2 12-pr. Trawler.—Wakakura.
The Cruisers Achilles and Leander and the Sloops Leith and Wellington are allocated to the station.

ROYAL CANADIAN NAVY.

Under control of the Canadian Department of National Defence.

Destroyers.—Fraser, ex-Crescent and St. Laurent, ex-Cygnet taken over by Canada 1936. Built by Vickers 1932; 1375 tons: 36,000 H.P.; 35½ knots; armament, 4 4·7 in., 1 3-in. A.A., 2 12-pr., 1 M.G., 4 smaller guns, 2 Quadruple 21″ torpedo tubes. Saguenay and Skeena completed at Thornycroft's in 1931; displacement, 1337 tons; 32,000 H.P.; speed, 35 knots; armament, 4 4·7-in., 2 2-pr., 2 quad. 21-in. torpedo tubes; oil, 440 tons.

Depot Ships.—Naden and Stadacona. Minesweeping Trawlers.—Festubert, Ypres, and Armentieres (1918), 360 tons.

SOUTH AFRICA.

[The seagoing force of the South African Naval Service was disbanded in 1934.]

ROYAL INDIAN NAVY.

Minesweeping Sloops.—Indus (1935, Hawthorn Leslie), 1,190 tons; 2,000 H.P.; 16¼ knots; 2 4.7-in., 15 smaller guns. Hindustan (1930, Swan Hunter), 1,190 tons; 2,000 H.P.; 16¼ knots; 2 4-in., 14 smaller guns. Clive, 2,021 tons; 1,700 H.P.; 14½ knots; 2 4-in., 2 2-pdr., 4 3-pdr. guns; completed Beardmore, 1920. Lawrence, 1,259 tons; 1,900 H.P.; 15 knots; 2 4-in., 4 3-pdr., 2 2-pdr. guns; launched Beardmore, 1919.

Sloops.—Cornwallis, 1,350 tons; 16½ knots; 2,500 H.P.; 3 4-in., 2 2-pdr., 4 3-pdr. guns (launched Hamilton, 1917, as the Lychnis).

Surveying Ships.—Investigator (Vickers, 1907), 1,172 tons; 1,550 H.P.; 13 knots; no guns.

Patrol Boats.—Pathan (ex-P.C. 69), 695 tons; 3,500 H.P., 20 knots, and 1 4-in. and 2 12-pdr. guns; completed 1918.

ARGENTINE REPUBLIC.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.	La Argentina .	7000	535	56	16	55,000	Vickers, Barrow	1937	..	..		..	..	..	..	..	9 *6-in.*, 4 *4-in.* A.A., 25 A.A. M.G., 1 catapult, 2 aircraft.	6 21″ (T.)	30	—	600
c.	Almirante Brown	6495	545¾	58	16¼	85,000 Y. (G.)	Leghorn .	1929	1931	1,250,000	..	1″	..	..	..	..	6 *7·5-in.*, 12 *4-in.* A.A., 6 Pom Poms, 1 catapult, 2 seaplanes.	6 21″ (T.)	32	— 1660	600
c.	Vinticinco de Mayo						Genoa .														
c.d.s.	General Belgrano†	6100	328	59¾	24	13,000	Leghorn .	1897	1899	696,700	6–3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 8 *6-in.*, 4 *6-pr.*	—	20	oil	515
c.d.s.	Pueyrredon † . .	6100	328	59¾	24	13,000	Sestri Ponente	1898	1901	782,000	6–3 H.S.	1½	6 H.S.	5 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 8 *6-in.*, 4 *6-pr.*, 1 *1-pr.* A.A.	—	20	oil	430
b.	Moreno . .	27,940	585	97¾	28	45,000* (G.)	Camden, N.J. (N.Y.S.B.Co.)	1911	1915	2,200,000	12–10 K.S.	3–2	9–6 K.S.	9 K.S.	12–9 K.S.	6 K.S.	12 *12-in.*, 12 *6-in.*, 4 *3-pr.*, 6 M., 4 L.	2 (sub.) 21″	22·5	— 4200	1200
b.	Rivadavia .						Quincy, Mass.		1914												940

The old coast-defence ironclads Libertad and Independencia, 2595 tons, completed at Birkenhead in 1891–93, and converted to oil fuel in 1927, carry two 9·4-in., four 4·7-in., and four 3-pr. guns. The Libertad is used as parent ship for submarines.

River gunboats Paraná and Rosario (Elswick, 1908), 1055 tons, two 6-in. howitzers, six 3-in., 2 L., 15 knots.

The training-ship (cruiser) (Birkenhead, 1896; refitted 1926), Presidente Sarmiento, 2320 tons, 15 knots; four 4·7-in., four 6-pr., two 3-pr.

Sloops (surveying vessels), San Juan and San Luis (Hawthorn Leslie, Newcastle, 1928), 790 tons, 1—3-in. 12 knots. Alferez Mackinlay (1914), 783 tons, 10 knots.

Tugs, Mataco, Toba (completed 1928, at Messrs. Hawthorn Leslie's, Newcastle), Azapardo (1919), Ona, Querandi (Thornycroft, 1914), and 12 others.

Nine Minesweepers (ex-German), seven transport and other auxiliaries. 6 Minesweepers building at Santiago; 500 tons; 1000 H.P.; 16 knots; 2 4-in. A.A. guns.

One cruiser, three sloops, two transports and four coastguard vessels are projected.

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* Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928.

† Converted to oil burning and armament altered in 1929. Used as training ships.

Seven despatch vessels of 550 tons are building in Argentine shipyards, and will be named Bouchard, Drummond, Granville Parker, Robinson, Seaver, and Spiro.

BRAZIL.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkheads.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.d.s.	**Floriano**	3162	267½ p.p.	48	13¼	3400	La Seyne .	1897	1901	..	13¾–4 H.S.	1½	..	..	8 H.S.	3 H.S.	2 *9·4-in.*, 4 *4·7-in.*, 2 M., 4 *6-pr.*; 2 L.	—	15·0	246 —	260
b.	**Minas Geraes** *	19,200	541	83	25	25,000 t B.&W.	Elswick .	1909	1910	1,821,400	9–6–4 K.S.	·2	9–6–4 K.S.	9	12–8 K.S.	9 K.S.	12 *12-in.*, 14 *4·7 in.*, 4 *3-in.* A.A.; 4 A.A. M.G.	—	21	2360 350	850
b.	**São Paulo**						Barrow .	1908	1910								12 *12-in.*, 12 *4·7-in.*, 6 *3-pr.*, 2 *3-in.* A.A.; 4 M.				
cr.	**†Bahia** . .	3150	401½	39	13½	22,000 B.C.T. (G.) Th.	Elswick .	1909	1910	..	..	..	..	..	..	..	10 *4·7-in.*, 4 *3-pr.*	4 21″ (D)	27	Oil	450
cr.	**†Rio Grande do Sul** . .																				

* Fitted with new oil-burning water-tube boilers by Thornycrofts, 1935.

† Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

RIVER GUNBOATS.—Missões (1904), 200 tons, 11 knots, one 15 pr., one 6 pr.; Oyapock, 195 tons, 14 knots, one 3 pr.
GUNBOATS.—Almirante Bastos dos Reis and Almirante Brasil; ordered in 1931.
MINELAYERS.—Maria do Couto, Carneiro da Cunha, Heitor Perdigao and Muniz Freire.
RIVER MONITORS.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro (1910). Parnahyba and Paragassu, 600 tons, 180½ feet in length, 12 knots.
GUNBOAT SCOUT.—Victoria (ex-Espirito Santo), 470 tons, two 4·7-in., two 3-pr., 11 knots.
SUBMARINE TENDER.—Ceará (Spezia, 1916), 4000 tons, 4100 H.P., 14 knots, four 4-in. guns.
ARMED TRANSPORT.—Belmont (ex-German SS. Valesia), 5227 tons gross, four 4·7-in, six 6-pr.
TRAINING SHIP.—Almirante Saldanha, Vickers' (1934). A four-masted schooner, 3325 tons, 262 feet in length, four 4-in. and one 3-in. A.A. guns.

The approved building programme includes two cruisers of 8,500 tons, to be completed in 8 years. Orders have not yet been placed.

CHILE.—Armoured Ships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**Almirante Latorre** * (ex-H.M.S. Canada)	28,950	661	92 6	29 0	37,000 P.T. Y.	Elswick	1913	1915	..	9–4	4–2½	4½	..	10	6	10 *14-in.*, 14 *6-in.*, 4 *4-in.*, A.A., 2 *3-in.*, A.A., 4 *3-pr.*, 1 catapult.	4 (sub.) 21″	23	Oil.	1000
cr.	**General O'Higgins**	6,977	412 p.p.	62 9	22 0	16,000 B.	Elswick	1897	1898	..	7–5	2	..	..	7½–6	6	4 *8-in.*, 10 *6-in.*, 12 *3-in.*, 4 M.	—	21·5 *t*	1200 —	500
b.	**Capitan Prat** †	5,416	328 p.p.	60 9	22 9	12,000	La Seyne	1890	1893	391,000	12	3	4	..	10½	2	4 *9·4-in.* (Canet), 8 *4·7-in.* (Canet), 8 *6-pr.*, 11 M.	2 18″	18	775 —	500

* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931).

† Submarine parent ship.

Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Coal.	Complement.
											Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft. ins.	ft. ins.						in.	in.			knots.	tons.	
cr.	**Blanco Encalada**	3435	370 p.p.	46 6	19 6	14,500	Elswick	1893	1894	..	4–1½	..	2 *8-in.*, 10 *6-in.*, 4 *3-in.*	—	22·78 *t*	850 —	385
,,	**Chacabuco**	3417	360 p.p.	46 6	17 0	15,500	Elswick	1901	1903	..	4½–1½	..	2 *6-in.*, 10 *4·7-in.*, 4 *3-in.*	—	24·0	1000 —	400

Oilers (Armstrongs, 1930): Maipo, 4,686 tons gross; Rancagua, 3,080 tons displacement, two 4·7-in. guns. **Coastguard Vessels**: Orompello, Leucoton, Elicura, 530 tons; built 1919; 14 knots; 2 3-in. guns; Aguila, 820 tons; Porvenir, 450 tons. Sibald, Yelcho, Micalvi, Condor, and Yanez. **Submarine Depot Ship**: Araucano (Vickers-Armstrongs, Barrow), completed 1930; displacement 5,890 tons; armament two 4·7-in.; length b.p. 390 ft.; beam 55 ft.; draught 16 ft. 6 ins.; speed 13 knots; H.P. 2,500; 1 seaplane.

Training Ship.—General Baquedano (1898), 2350 tons, four 4-in. guns, two 3-pr. Five tugs. Two towing launches.

DENMARK.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Second-ary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ins.	ft.	ins.	ft.	ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
cr.	Niels Juel .	3800	295	4	53	6	15	9	5500	Copenhagen	1918	1923	..	8–4 K.S.	2	..	..	..	2 K.S.	10 *5·9-in.*, 2 *6-pr.*, 8 M.G., 10 *20*-m.m. A.A.	2 (sub.) 18″	17·0	240 250	309
c.d.s.	Olfert Fischer †	3415	283	9	50	6	16	9	4600 *t*	Copenhagen	1903	1905	..	7–4	3	..	..	7	6	2 *9·4-in.*, 4 *5·9-in.*, 6 *3-in.*, 2 *6-pr.* A.A., 2 *1-pr.*, 2 M.	3 (sub.) 18″	16·0	250 —	256
c.d.s.	Peder Skram .	3500	286	7	51	6	16	3	5400	Copenhagen	1908	1909	..	8–4 K.S.	2	..	..	7 K.S.	6 K.S.	2 *9·4-in.*, 4 *5·9-in.*, 8 *3-in.*, 2 *1-pr.*, 2 *3-in.* A.A., 2 M.	4 (sub.) 18″	16·0	250 —	262

† Removed from the active list in 1936. To be used as a target ship.

Mine-layers: Lossen (1910), 640 tons, 12 knots, 2 3-in., 2 A.A. guns, 175 mines; Kvintus, ex-Minekran v and Sixtus, ex-Minekran vi, 186 tons, 8 knots, 60 mines; **Mining boats 1–10. Groensund, torpedo boat repair ship (Diesel-electric drive); Hekla, submarine depôt ship. Submarine depôt and repair ship Henrik Gerner completed 1928, displacement 490 tons, 2450 H.P., 13 knots, carries two 3-in. guns. Fishery protection vessels: Aegir, Odin, Thor (Iceland Government), Hvidjörnen, Diana, Fenris, Island Falk, Fylla (ex-British sloop Asphodel), Beskytteren, Maagen; Ingolf (1934, to replace Fylla) 3000 H.P., two 4·7 in. and two 6-pdr. guns, one seaplane.**

Surveying vessels Marstrand, built 1861, refitted 1922–1923, 158 tons, 11 knots, carries 2 M.G. Hejmdal (1935). Ternen (1937).

Six minesweepers (ex-Torpedo boats *), 96 tons. Five patrol vessels (ex-Torpedo boats *), 96 tons.

* See Flotilla Tables.

FRANCE.—Battleships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Richelieu .	35,000	794 0 W.L.	108 6	26 7	..	Brest .	Bldg.	..	..	9–16	8	..	..	..	..	8 *15-in.*, 16 *5·1-in.*, 8 *1·5-in.* A.A., 2 catapults, 4 aircraft.	..	..	..	..
b.	Jean Bart .	35,000	794 0 W.L.	108 6	26 7	..	St. Nazaire	Bldg.	..	..	9–16	8	..	..	..	..		..	..	..	..
b.c.	Strasbourg .	26,500	702 0	102 0	25 0	160,000	St. Nazaire	1936	Bldg.	..	..	..	..	..	..	..	8 *13-in.*, 16 *5·1-in.*, 40 *smaller*, 2 catapults, 4 aircraft.	..	32	..	..
b.	Dunkerque .	26,500	702 0	101 8	27 11	100,000 -120,000	Brest .	1935	1937	5,200,000	10–8	4–9	..	..	..	..	8 *13-in.*, 16 *5·1-in.*, 8 *1·5-in.* A.A., 32 *smaller*, 2 catapults 2 aircraft.	..	abt. 29	..	..
b.	Bretagne .	22,189	544 6	88 6	32 0	29,000 Nic. P.T.	Brest .	1913	1915	2,589,439	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 14 *5·4-in.*, 8 *3-in.* A.A., 5 *3-pr.*, 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	— 2600	1167
b.	Condorcet * .	17,597	480 11	84 7	27 0	22,500 Nic. P.T.	St. Nazaire	1909	1911	2,165,200	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾ K.S.	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2100 —	890
b.	Courbet . .	22,189	551 0	92 6	32 0	28,000 Nic. P.T.	Lorient .	1911	1913	2,508,388	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·4-in.*, 2 *3-pr.*, 7 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2600 250	1140
b.	Océan, *ex* Jean Bart * . .	22,189	551 6	92 6	32 6	28,000 B. P.T.	Brest .	1911	1913	2,528,888	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·4-in.*, 4 *3-pr.*, 7 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2700 300	1140

b.	**Lorraine** * .	22,189	544 6	88 6	32 0	29,000 B. P.T.	St. Nazaire	1913	1916	2,642,439	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	8 *13·4-in.*, 14 *5·4-in.*, 8 *3·9-in.* A.A., 5 47mm. A.A., 2 *1-pr.*, 2 L.	4 (sub. 18"	22·0	2700 300	1167
b.	**Paris** . .	22,189	551 0	92 6	32 6	28,000 N. P.T.	La Seyne .	1912	1914	2,608,920	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·4-in.*, 4 *3-pr.*, 7 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18"	20·0	2700 250	1140
b.	**Provence** .	22,189	544 6	88 6	32 0	29,000 P.T.	Lorient .	1913	1916	2,589,000	11 7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 14 *5·4-in.*, 8 *3-in.* A.A., 5 *3-pr.*, 2 *1-pr.*, 2 L.	4 (sub.) 18"	22·0	2700 300	1167

* No longer on effective list. Used as training ships.

All the above battleships were reconstructed and modernised between 1923 and 1930. The new building programme includes 2 additional 35,000-ton battleships. Since 1930 all except Condorcet have been taken in hand for conversion to oil-fuel burning.

Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
											Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.			knots.	tons.	
A.C. .	**Bearn** * . . .	22,146	599 0	115 6	30 6	37,200	Chantiers de la Mediterranée, La Seyne	1914	1928	..	3¼ 1–3	..	8 *6·1-in.*, 6 *3-in.* A.A., 8 *1-pr.* A.A., 12 M. A.A., 41 planes	4 21·7"	21·5	— 2070	875
Aircraft Transport	**Commandant Teste**	10,000	548 0	88 7	22 9	21,000 †	Chantiers de la Gironde, Bordeaux	1929	1932	..	2 1½	..	12 *3·9-in.* A.A., 8 *3-pr.* A.A., 12 M., 19 planes, 4 catapults, 5 cranes.	—	20·5	oil	648

* Originally designed and laid down as a battleship; reconditioned 1935.

† Schneider-Zoelly turbines (G.). Yarrow-Loire S.T. boilers.

It is understood that two aircraft carriers are to be laid down during 1937.

FRANCE.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
														Belt.	Gun Position.	Guns.	Torpedo Tubes.		Coal. / Oil.	
		tons.	ft.	ins.	ft.	ins.	ft.	ins.					£	in.	in.			knots.	tons.	
Training cruiser	**Jeanne d'Arc** . .	6496	557	8	57	6	18	8	32,500	Penhoet Yard, St. Nazaire	1930	1931	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 2 *1·6-in.*, 2 M., 2 seaplanes	2 21·7″	26	..	506
1931–32 *programme*	**Jean-de-Vienne**	7600	587	3	57	2	16	5	84,000	Lorient .	1933	1936	..	..	..	9 *6-in.*, 8 *3·5-in.* A.A., 8 *1-pr.*, 1 catapult, 4 aircraft	4 21″	31	1,500	537
	La Galissonnière									Brest .		1935								
1932–33 *programme*	**Marseillaise**	7600	587	3	57	4	17	5	88,000	Ch. de la Loire, St. Nazaire	1935	1937	..	4¾	Deck 1½	9 *6-in.*, 8 *3·5-in.* A.A., 8 *5-in.* A.A., 4 seaplanes	4 21″	32½	— / 1500	630
	Gloire . .									Bordeaux	1935									
	Montcalm .									La Seyne	1935									
	Georges Leygues									Penhoet Yard, St. Nazaire	1935									
—	**Algérie** . . .	10,000	610	3	65	8	23	0	84,000 (G.) Pen.	Brest . .	1932	1934	1,920,000	about 4	..	8 *8-in.*, 12 *3·9-in.* A.A., 8 *1-pr.*, 16 M., 2 catapults, 2 seaplanes	2 triple 21″	31	oil / 1800	746
Suffren Class	**Dupleix** . .	10,000	636	6	63	6	24	0	90,000 (G.)	Brest .	1930	1932	1,570,000	..	..	8 *8-in.*, 8 *3·5-in.* A.A., 6 *1-pr.* A.A., 12 M., 3 seaplanes, 2 catapults.	2 triple 21″	32	oil / 1800	605
	Foch . .										1929	1931	1,450,000							
	Colbert . .										1928	1931	1,270,000							
	Suffren . . .	10,000	607 b.p.	0	65	0	24	0	90,000 (G.)	Brest .	1927	1930	1,210,000	..	..	8 *8-in.*, 8 *3-in.* A.A., 8 *1-pr.* A.A., 12 M., 3 seaplanes, 2 catapults	2 triple 21″	32	— / 1800	605
Duquesne Class	**Tourville** .	10,000	626	8	62	4	23	0	120,000 (G.)	Lorient .	1926	1928	..	..	..	8 *8-in.*, 8 *3-in.* A.A., 8 *1-pr.*, 2 seaplanes, 1 catapult	2 triple 21″	33·2	— / 2000	620
	Duquesne .									Brest .	1925									
Duguay-Trouin Class	**Duguay-Trouin**	7249	594	10	57	6	20	8	110,000 (G.)	Brest . .	1923	1926	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 2 *3-pr.*, 4 M., 1 L., 1 seaplane, 1 catapult	4 triple 21·7″	33	— / 1480	578
	Primauguet .									Brest . .	1924	1927								
	La Motte Picquet									Lorient .	1924	1927								

M.Cr. .	Emilé Bertin .	5886	580	9	52	0	16	4	100,000–120,000 P.T. (G.)	Penhoet, St. Nazaire	1933	1934	..	..	..	9 *6-in.*, 4 *3·5-in.* A.A., 4 *1-pr.*, 250 M., 1 catapult, 2 aircraft.	6 21·7" a.w. (T.)	34·0	oil	550
„ .	Pluton . . .	4773	500	4	51	0	20	0	57,000 (G.)	Lorient . .	1929	1931	..	..	..	4 *5·4-in.*, 4 *3-in.* A.A., 2 *1-pr.*, 12 M., 450 mines.	—	30·0	oil	400

NOTE.—The new building programme includes 2 cruisers.

RIVER GUNBOATS.—Francis Garnier (1929), 639 tons, 15 knots, two 4-in., one 3-in. A.A.; Vigilante, Argus (1924), 218 tons, 12 knots, two 3-in., two 1-pr.; Balny (1921), 201 tons, 14 knots, one 3-in.; La Grandière (1921), 39 tons, 11 knots; Doudart de Lagrée (1909), 183 tons, 14 knots, one 3-in.; Mytho, Tourane (1934), 95 tons, 250 H.P. (Diesel), 10 knots, one 3-in., two 1-pr.; Chaloupe Fluviale (1926), 38 tons, 9 knots, 1 small gun; Avalanche and Commandante Bourdaise (1920), 128 tons, 16·5 knots, one 3-in. gun, two 1-pr.

GUNBOAT.—Jouffroy d'Abbans, 400 tons, 15 knots, 2-3 in., building.

MINESWEEPERS.—Conquérante (1918), 374 tons, 17 knots, two 3·9-in.; Luronne (1917), 266 tons, 13·8 knots, two 3·9-in.; Impétueuse, Bataillеuse, Audacieuse (1917), 266 tons, 15 knots, two 3·9-in.; Engageante, Diligente (1917), 315 tons, 17 knots, two 3·9-in.; Étourdi (1916), 310 tons, 17 knots, two 3·9-in.; Gracieuse, Dédaigneuse, Tapageuse, Surveillante (1916), 266 tons, 15 knots, two 3·9-in.; Granit, Mica, Meulière, Quartz (1919), 354 tons, 12·5 knots, one 9-pr. Commandant Bory, Commandant Delage, Commandant Duboc and Commandant Riviere, 630 tons, 20 knots, two 3.9-in. Elan, Chamois, Chevreuil, Gazelle 630–647 tons, 20 knots, two 3·9-in. Ten minesweepers included in 1937 programme.

MINELAYERS.—Castor, 3,150 tons, 14 knots, four 3·9-in., two 1·5 A.A.; Pollux, 2,461 tons, 14 knots, four 3·9-in. Both converted 1930.

SUBMARINE PARENT SHIP.—Jules Verne (1931), 5,747 tons, 7,000 H.P. (Diesel), 16 knots, mounting four 3·5-in. A.A., four 1-pdr. A.A.

SLOOPS.—Bougainville, Dumont D'Urville, Savorgnan de Brazza, and d'Entrecasteaux (1932–1933), Rigault-de-Genouilly Amiral Charner, and D'Iberville (1933–1935), 1970 tons, 3,200 H.P. (Diesel), 17 knots, armament three 5·4-in., four 1·5-in. A.A., 6 M., 50 mines, 1 seaplane. Ville d'Ys (1917) (on fishery protection duties), 1,122 tons, 17 knots, mounting three 3·9-in., two 3-in. (1 A.A)., 2 M.; Altair (1916), 1122 tons, 17 knots, mounting two 5·4-in., two 3-in. A.A., 2 M. Two included in 1937 programme.

DESPATCH VESSELS.—Duperré Class:—Du Couedic, Enseigne Henry, Duchaffault, Dubourdieu (1919–1920), 453 tons, 17 knots, one 5·4-in., one 3·9-in. "Arras" Class:—Reims, Remiremont, Révigny, Belfort, Calais, Lassigny, Les-Eparges, Vauquois, Vimy, Ypres, Epinal, Nancy, Coucy, Laffaux, Amiens, Tahure, Arras, Bapaume (1919–1923), 644 tons, 20 knots, two 5·4-in., one 3-in. A.A. guns (Belfort detached to Air Ministry—no armament, and Ypres employed on hydrographic work—no armament. "Aisne" Class:—Ailette, Ancre, Scarpe, Suippe, Meuse, Yser, Somme, Oise, Aisne, Marne (1917–1918), 490–600 tons, 21 knots, four 3·9-in. guns, 1 3-in. Quentin-Roosevelt for fishery protection (1918), 586 tons, 13 knots, one 3-in gun. Four Avise dragueurs Elan, Chamois, Chevreuil and Gazelle of 640 tons, 20 knots, two 3·9-in. guns, laid down in 1936, and four vessels are projected.

NET-LAYERS.—Le Gladiateur, (1934), 2,293 tons, 370 ft. 8-in. long, 7,700 H.P., 21 knots, four 3·5 in. A.A., 6 M. A second is projected.

ESCORTEURS (Convoy Sloops).—Bayonnaise, Cordelière, Poursurvante, Incomprise, Melpomene, Flore, Pomone, Iphigenie, Branle-Bas, Bombarde, Bouclier and Baliste (1936), 610 tons, two 3·9-in. guns, 2 A.A., m.g., 2 single and 1 twin 16-in. torpedo tubes, 22,000 H.P., 34½ knots.

SURVEYING SHIPS.—Amiral Mouchez, 719 tons, 12 knots. Astrolabe, Octant, and Gaston-Rivier (1918), 460 tons, 10 knots; Chimère (1901), 613 tons, 14 knots; Utile (1894), 450 tons, 13 knots, one 3-pdr. Estafette, Sentinelle, 450 tons, 10 knots.

C.M.Bs.—V.T.B. 1 (1922) (55 feet), 10 tons, 37 knots; V.T.A. 2 (1929), 6 tons, 37 knots; V.T.B.'s, 4, 5 and 7, 11 tons, 1000 H.P., 39 knots, two torpedoes; V.T.B.'s 8, 9 and 10, 19 tons, 2000 H.P., 46 knots. Two included in 1937 programme.

SUBMARINE CHASERS.—Nos. 1–4 (1935), 148 tons, 2,400 H.P., 20 knots, one 3-in. gun. Twenty-seven in number (1918), 70 tons, 16 knots, one 3-in gun. Eighteen included in 1937 programme.

REPAIR SHIP.—Vulcain, 9,685 tons, 13 knots, four 3-in.

PATROL VESSELS.—Primevère, 490 tons, 8 knots. Fauvette II, Passereau II, 315 tons, 10 knots.

GERMANY.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Battleship "F"	35,000	..	..	..	..	Hamburg	Bldg.	..	..	..	..	..	..	..	..	*15*-inch.	..	30	..	..
b.	Battleship "G"	35,000	..	..	..	..	..	Bldg.	..	..	..	..	..	..	..	..	*15*-inch.	..			
b.	Scharnhorst	26,000 (standard)	741 6	98 6	24 8	..	Wilhelmshaven	1936	Bldg.	..	..	..	..	..	..	..	9 *11-in.*, 12 *5·9-in.*, 6 *4*-in. A.A., 2 aircraft.	..	..	..	..
b.	Gneisenau		..	..	..	..	Kiel	Bldg.	..	..	..	..	..	..	..	..		..	30	..	..
b.*	Deutschland	10,000 (standard)	609	67 6	19 0	54,000–56,800 Diesel ‡	Deutsche Werke, Kiel	1931	1933	estimated 3,750,000	about 4	1½–3	—	—	about 7	—	6 *11-in.*, 8 *5·9-in.*, 6 *3·5-in.* A.A., 8 *3-pr.*, 10 M., 1 catapult, 2 aircraft.	8 19·7″ (Q.)	26	— / 1200	634
b.*	Admiral Scheer						Wilhelmshaven	1933	1934	estimated 3,530,000											
b.*	Admiral Graf Spee						Wilhelmshaven	1934	1936	estimated 3,530,000					—						
b.	Hessen §	12,988	418 5	72 10	25 3	16,000 T.S. recip.	Kiel (Germania)	1903	1905	1,157,500	9–4 K.S.	3	6 K.S.	6 K.S.	10–6 K.S.	6 K.S.	4 *11-in.*, 12 *6·7-in.*, 4 *3·4-in.* A.A., 23 M.	4 a w. 19·7″	18	1574 / 197	727
b.	Schlesien †	13,040	419 0	72 10	25 3	17,000 T.S. recip.	Schichau Germania	1906	1908	1,214,000	9½–4 K.S.	3	8 K.S.	6 K.S.	11–6 K.S.	6¾ K.S.	4 *11-in.*, 10 *5·9-in.*, 4 *3·5-in.* A.A., 23 M.	4 a.w. 19.7″	18	1771 / 197	727
b.	Schleswig-Holstein †																				
	AIRCRAFT CARRIERS.																				
A. C.	"A"	19,250	820 3	88 6	18 4			Bldg.									*5·9 in.* guns.				
A. C.	"B"																				

* Officially rated as "Armoured Ships."

† Reconstructed 1925–30.

‡ Consists of eight double acting two-stroke M.A.N. Diesels.

§ Is now a target vessel.

GERMANY.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam. (Extreme.)		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ins.	ft.	ins.	ft.	ins.						£	in.	in.			knots.	tons.	
cr.	J	10,000	650	0	..		..		..	..	..		..	..	..	..	8 *8-in.*, 8 *4-in.* A.A., 8 *3-pr.*	12 *21-in.*	32	..	..
cr.	(G) Blücher											1937									
cr.	(H) Admiral Hipper											1937									
cr.	K	10,000	..		..		..		..	..	..	Bldg.	..	..	..	..	*5·9-in.*	..	..	..	..
	L																				
l.c.	Leipzig	6000	580	0	53	5	15	7	72,000† [geared turbines 60,000, Diesels 12,000]	Wilhelmshaven	..	1929	1931	2,050,000	3–4	..	9 *5·9-in.*, 8 *3·5-in.* A.A., 8 *3-pr.*	4 triple *19·7-in.* a.w.	32	— 1500 (including Diesel oil)	656
l.c.	Nürnberg	6000	580	0	53	5	14	3	72,000	Kiel	..	1934	1935	..	..	..	9 *5·9-in.*, 8 *3·5-in.* A.A., 8 *3-pr.*	4 triple *19·7-in.* a.w.	32	— 1500	656
l.c.	Köln	6000	570	10	49	10	17	8	65,000‡	Wilhelmshaven	..	1928	1930	1,785,000	3–4	..	9 *5·9-in.*, 4 *3·5-in.* A.A., 1 catapult, 2 aircraft.	4 triple *19·7-in.* a.w.	32	— 1200	571
l.c.	Karlsruhe									Deutsche Werke, Kiel	..	1927	1929	1,985,000		..					
l.c.	Königsberg									Wilhelmshaven	..	1927	1929	2,100,000							
l.c.	Emden *	5400	510	2	46	11	17	4	46,500 (G.)	Wilhelmshaven	..	1925	1925	..	3	..	8 *5·9-in.*, 3 *3·5-in.* A.A., 4 M.	2 twin *19·7-in.* a.w.	29	— 700	483

Escort Vessels.—10 (1936), 600 tons, 249 feet, 2 4·1-in. 2 m.g., complement 103. 15 patrol vessels building, 1 m.g. 2–20 in. T.T.

Gunnery Training Ships.—Drache (1908), 790 tons, 15 knots, 4 4·1-in.; Fuchs (1919), 525 tons, 16 knots, 2 4·1-in. Gunnery Tender Bremse (Wilhelmshaven, 1932), 1,250 tons, 339½ feet long, 31 ft. 2 in. beam, 25,000 H.P. (Diesel), 27 knots, 4 4·1-in. guns, complement 162. Brummer (1936), 2,410 tons, 20 knots 4 4-in. guns.

Fishery Protection Vessels.—Weser and Elbe (Wilhelmshaven, 1931), 590 tons, 1600 H.P. (Diesel), 15 knots; Zieten (1919), 541 tons, 17 knots, 1 4·1-in. gun.

Experimental Vessels.—Pelican and Nautilus (500 tons, 17 knots).

Minesweepers.—29 in number (reciprocating machinery). 475–525 tons, 16 knots. 12 in number laid down in 1936. 600 tons (M 13—M 24).

Sailing Training Ships.—Gorch Fock (Hamburg, 1933) (replacing the Niobe). Three-masted barque, 239 feet in length, 1,500 tons, 500 H.P. auxiliary motor giving 8 knots. Horst Wessel (1936), 295 ft. 3 in. in length, 35 ft. 4 in. beam, 15 ft. 9 in. draught, 750 H.P., auxiliary motor giving 10 knots, complement 289.

Barrage Craft.—R 1—16 (1933-4), 85 ft., 44 tons, 700 H.P., 17½ knots, 1 1-pr. gun. R 17—20 (1935), 90 tons. R 21—24 building. Mining and Barrage vessels MT 1 and 2, 550 tons, 10 knots; 12 small craft.

Patrol or Guard Boats.—S 1—6 (1932), 92 ft., 46 tons, 2,400 H.P., 31½ knots. S 7—17 (1936), 92 ft. 2 19·7-in. T.T. UZ 18, 32, 33, 102 ft.. 60 tons, 500 H.P., 14 knots. Target Ships.—Zähringen (ex-battleship), 11,800 tons. Hessen. Wireless controlled.

Target Tugs and Control Ships.—Pfeil, Komet, and Blitz, 650 tons. 30 knots *ex* T.B.'s. Blitz is control ship for Zähringen.

Fleet Tenders.—Hela, Nordsee, 825 tons. Station Tenders.—Nixe, Frauenlob, 520 tons.

Surveying Vessels.—Meteor (1924), 1150 tons, 14 knots, one 3·4-in., and two surveying launches, 90 tons.

Depot Ships.—Four projected. Motor Torpedo Boats.—S. 18, S. 19, building.

* Training Ship.

† Three propeller shafts, of which the centre shaft is Diesel-driven and the outers turbine-driven. Diesels used for cruising or combined with the turbines to give full speed.

‡ Parsons geared turbines with Diesels for cruising.

GREECE.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Secondary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
cr.	**Giorgios Averoff** *	9301	462	69	24¾	19,000 (21,500 *t*) B.	Leghorn (Orlando)	1910	1911	1,100,000	8–3½ K.S.	1¾	7	7	8–6½	7	4 *9·2-in.*, 8 *7·5-in.*, 16 *3-in.*, 4 *3-pr.*, 2 *3-in.* A.A., 2 M.	3 (sub.) *18-in.*	22½ (24 *t.*) ‡	1500 / —	620
cr	**Helle** † (*ex* Fei-Hung)	2083	322	39	14	6000 P.T. (G.)	Camden, N.J.	1912	1913	240,000	..	1¼	..	..	..	..	3 *6-in.*, 1 *3-in.* A.A., 110 mines	2 a.w. *18-in.*	20 ‡	600 / 100	230

* Retubed and refitted 1927. † Repaired and converted to oil burning in France and fitted as a minelayer in 1929. ‡ Probable speed 15 knots.

Training ship, Ares, 1,870 tons, 10 knots, four 3-in. guns, completed at Chantiers de la Méditerranée, la Seyne, 1929. Repair ship, Hephestos (1920), 4,549 tons gross, 11½ knots, four 4-in. A.A. Surveying ship (old sloop), Nautilus, 400 tons, 11 knots, two 3-in guns. Dispatch vessels, Korghia Lenios (1916), 380 tons, 13½ knots, and Kichli (1884), 86 tons, 10 knots. C.M.B's., two Thornycroft type, 55 ft., two Lewis guns 2 T.T. 4 built at Venice, 69 ft., for Customs Service. One light cruiser projected.

ITALY.—Battleships.

Class.	NAME.	Standard splacement.	Length. (Extreme.)		Beam.		Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Second-ary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal.	Fuel. Oil.	Complement.
		tons.	ft.	ins.	ft.	ins.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.		
b.	Littorio .	35,000	774	0	103	8	28	150,000 (G.T.)	Genoa (Ansaldo)	1937	..	..	10	..	..	..	..	..	9 *15-in.*, 12 *6-in.*, 12 *3·5-in.* A.A., 2 catapults, 4 aircraft.	..	30	..		1600
b.	Vittorio Veneto								Trieste .															
b.	Andrea Doria .	21,555	575	9	92	0	29	34,000 P.T. Y.	Spezia .	1913	1916	..	10–4 K.S.	1¾	6 K.S.	..	9½ K.S.	6 K.S.	13 *12-in.*, 16 *5-in.*, 13 *3-in.*, 6 *3-in.* A.A., 2 *2-pr.*, 6 M., 4 L., 1 catapult, 1 aircraft	2 (sub.) *18-in.*	21	1200	800	1074
b.	Caio Duilio .							31,000 P.T. Y.	Castellammare	1913	1915													
b.	Conte di Cavour‡	23,622	629	0	92	0	29	..	Spezia .	1911	1915	..	10–4½ K.S.	1¾	6 K.S.	..	9½ K.S.	5 K.S.	10 *12·6-in.*, 12 *4·7-in.*, 8 *3·9-in.* A.A., 20 A.A. M.G., 2 catapults, 4 aircraft.	..	27		2000	1200
b.	Giulio Cesare ‡ .	23,622	629	0	92	0	29	..	Genoa (Ansaldo)	1011	1914	..	10–4½ K.S.	1¾	6 K.S.	..	9½ K.S.	5						
§	San Giorgio .	9232	462	2	69	0	24¾	18,000 recip. Bl.	Castellammare	1908	1910	..	8–3 K.S.	1¾	7 K.S.	7 K.S.	7–6 K.S.	7 K.S.	4 *10-in.*, 8 *7·5-in.*, 10 *3-in.*, 6 *3-in.* A.A., 2 *3-pr.*, 6 M., 2 L.	2 (sub.) *18-in.*	22	1556	115	689
§	San Marco ** .	8600					22¾	13,000 P.T. B.			1911										32½	1550	66	

‡ As modernised 1936—1937. Lengthened 52 ft. and amidship triple turret removed.

§ Armoured Cruisers, classified as Battleships, 2nd class, in Italian Official Lists. ** Converted into target ship under wireless control. Armament removed.

ITALY.—Cruisers, &c.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Side. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft.					£	in.	in.			knots.	tons.	
Improved Condottieri Class	Duca degli Abruzzi Guiseppe Garibaldi	7894	613 9	61 0	17	100,000	Odero-Terni, Orlando Spezia Cantieri Riuniti dell' Adriatico, Trieste	1935	1936	..	..	..	10 *6-in.*, 8 *3·9-in.*, 8 *1·5-in.* A.A., 8 M., 4 aircraft, 2 catapults.	6 21″	35	1200	600
Attendolo Class	Eugenio di Savoia Filiberto Duca d'Aosta	7283	610 3	57 4	16 4	110,000	Ansaldo, Genoa Orlando, Leghorn	1935	1936	..	..	..	8 *6-in.*, 6 *3·9 in.*, 8 *1-pr.* A.A., 8 M., 1 catapult, 3 aircraft	6 21″	36½	1200	550
Zara Class	Pola	10,000	600 0	67 8	20·2	95,000 (G.)	Orlando, Leghorn	1931	1933	..	Abt. 6	..	8 *8-in.*, 16 *3·9-in.* A.A., 16 smlr., 1 catapult, 2 aircraft	—	32 (33 t.)	oil	840
Condottieri Class	Montecuccoli Muzio Attendolo	6941	597 9	54 6	14·2	106,000 P.T.	Ansaldo, Genoa Trieste	1934	1935	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 *1-pr.* A.A., 8 M., 2 aircraft, 1 catapult.	4 21″	37	oil	520
Zara Class	Gorizia	10,000	600 0	67 8	20·2	95,000 (G.)	Orlando, Leghorn	1930	1931	..	Abt. 6	..	8 *8-in.*, 16 *3·9-in.* A.A., 12 smlr., 1 catapult, 2 aircraft	8 21″	34	oil	840
Modified Trento Class	Bolzano	10,000	646 3	67 8	18 0	150,000	Ansaldo, Genoa	1932	1933	..	Abt. 3	..	8 *8-in.*, 16 *3·9-in.* A.A., 12 smaller, 1 catapult, 2 seaplanes.	8 21″	36	oil	720
Condottieri Class	Armando Diaz Luigi Cadorna	5008	554 6	50 10	14	95,000 (G.)	Odero-Terni, Spezia Stabilimento Tecnico Triestino, Trieste	1932 1931	1933	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 M., 1 catapult, 2 seaplanes	4 21″ (D.)	37 (39¾ t.)	oil	530
Zara Class	Zara Fiume	10,000	599 10	67 8	20·2	95,000 (G.)	Odero-Terni, Muggiano Stabilimento Tecnico Triestino, Trieste	1930	1931	..	4 / —	..	8 *8-in.*, 16 *3·9-in.* A.A., 16 smaller, 1 catapult, 2 aircraft	—	32	2200	800
Condottieri Class	Alberto di Giussano Alberico da Barbiano Bartolomeo Colleoni Giov. delle Bande Nere	5069	555 5	50 10	14·2	95,000 (G.)	Ansaldo, Sestri-Ponente Castellamare	1930	1930 1931 1932 1930	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 *1-pr.*, 8 M., 1 catapult, 2 seaplanes	4 21″ (D.)	37	1200	500

Trento Class	Trieste ‡ . Trento . .	10,000	645	0	67	9	18	150,00 (G.)	Orlando, Leghorn Stablemento Tecnico, Trieste .	1926 1927	1929	..	2¾/2	..	8 8-*in.*, 16 3·9-*in.* A.A., 4 1-*pr.*, 8 M., 1 catapult, 2 seaplanes.	8 a.w. (D.)	35 36	—/3000	1000 800
l. c. .	Bari (*ex*-German Pillau)	3248	443	11	44	7	13½	28,000 tur.	Danzig (Schichau) .	1914	1915	..	—/1½–¾	1	8 5·9-*in.*, 3 3-*in.* A.A., 3 M., 120 mines. 2 aircraft.	2 19.7″	27·5	984/250	372
l. cr. † .	Quarto . .	2900	431	9	42	2	13¼	29,000 P.T. Bl.	Venice . .	1911	1912	..	—/1½–¾	..	6 4·7-*in.*, 4 3-*in.*, 2 2-*pr.* A.A., 3 M., 126 mines	2 a.w. 18″	28	49/482	256
l. cr. .	Taranto (*ex*-German Strassburg)	3184	455	0	42	2	12¼	27,000 P.T. T.S.	Wilhelmshaven .	1911	1914	416,340	4–2½/—	2	7 5·9-*in.*, 2 3-*in.* A.A., 3 M., 120 mines	2 19·7″	21	1200/—	373
s.c. .	Miraglia * . .	4882	397	0	49	3	17	12,000 P.T.	Spezia . . .	1923	1927	..	..	..	4 4-*in.* A.A., 4 M., 2 catapults, 16 planes	—	21·5	—/440	300

* *Ex*-merchant ship, taken over on the stocks. Aircraft transport. † Classified as Scouts in Italian Lists. ‡ Fleet Flagship.

Combined Minelayers and Minesweepers.—Fasana, Buccari, Durazzo, and Pelagosa, completed 1926, 531 tons, 10 knots (I.C. machinery), 1 *3-in.* gun, 54 mines; Azio, Legnano, Lepanto, Dardanelli, Milazzo, and Ostia, completed 1926-7, 615 tons, 15 knots (recip.), 2 *4-in.*, 1 *3-in.*, 80 mines. Cotrone, Viesti, 359 tons, 195 ft., 1600 H.P., 14 knots, 2 *4-in* guns.

Minelayers.—Laurana, Rovigno, and Albona (*ex*-Austrian), 112 tons, 11 knots, 1 *3-in.*

Minesweepers.—38 in No., 200 tons, 14 knots, 1 *3-in.* gun, 4 in No., 620 tons, 138 ft., 9 knots, 2 *3-in.* guns.

Oil Transports.—Marte, Dalmazia, Istria, Livenza, Urano, Prometeo, Cocito, Lete, Stige, Niobe, Cerere, Giove, Tarvisio, Quarnero, 10–14 knots, 2–4 *4·7-in.* guns. Oil transport with under-water protection, Brennero, 10,000 tons, 10½ knots, 4 *4·7-in.* guns.

River Gunboats.—S. Caboto (1912), 778 tons, 13 knots, 6 *3-in.* guns; E. Carlotto (1918), 180 tons, 14 knots, 2 *3-in.* A.A. guns. Escort Gunboats.—A. Bafile, T. Farinati, E. Giovannini, C. del Greco, and A. Vitturi (1922), 182 tons, 23 knots, 2 *4-in.* guns, 2 T.T.

Surveying Vessels.—Ammiraglio Magnaghi (1914), 1506 tons, 14 knots, 4 *3-in.*; Cariddi (1916), 330 tons, 10 knots, 1 *3-in.* gun: Scilla (1916), 350 tons, 9 knots, 1 *3-in.* gun. 63 Armed Motor Boats (M.A.S.) built and a considerable number under construction, displacement 10–20 tons.

Patrol Vessels.—Cherso and Lussin (1912), 4000 tons, 10½ knots, 4 *4·7-in.* guns; Lante and Bianco (1917), 280 tons, 12 knots; Lutti and Cirene (1912), 340 tons, 10 knots; Corsini (1912), 290 tons, 12 knots; Rimini (1912), 319 tons, 9½ knots, 1 *3-in*, gun; Gallipoli (1911), 310 tons, 10½ knots, 2 *3-in.* guns.; Otranto (1911), 290 tons, 10 knots, 2 *3-in.* guns; Alula (1912), 308 tons, 13 knots, 1 *3-in.* gun.

Training Ships.—Cristoforo Colombo (Castellamare, 1928), 2,787 tons, 10 knots (Diesel-electric) 4 *3-in.* guns; **Amerigo Vespucci (Castellamare, 1931), 3,543 tons, 1,800 H.P. (Diesel-electric), 11 knots, 4 *3-in.* A.A.** Submarine Depôt Ships (Sloops).—Volta and Pacinotti (1924), 2,362 tons, 19 knots, 4 *3-in.* A.A.

Cable Ships.—Citta di Milano (5,300 tons), 10 knots. Giasone, 1192 tons, 250 ft., 15 knots, 2 *3-in.* A.A. guns. One submarine chaser, Albatros (1934), 340 tons, 24½ knots, 2 *4-in.* and 4 *1·5-in.* A.A.

Tugs.—65 in No. Water Carriers.—44 in No.

Distilling Ship.—Citta di Siracusa (1910), 3590 tons, 1,200 H.P., 20 knots, 2 *3-in.* guns.

Target Ship.—San Marco, Old Cruiser.

Motor Torpedo Boats.—A large number building.

JAPAN.—Battleships.

Type.	NAME.	Standard Displacement.	Length. (Extreme.)		Beam.		Draught.		Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.		Complement.
														Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.		Coal.	Oil.	
		tons.	ft.	ins.	ft.	ins.	ft.	ins.						in.	in.	in.	in.	in.	in.			knots.	tons.		
Fuso Class	Fuso §	29,330	673	0	94	0	28	6	40,000 B.C.T.	Kure	1914	1915	..	12·4 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 16 *6-in.*, 8 *5-in.* A.A., 4 M., 4 L., 1 seaplane	2 (sub.) *21-in.*	22·5	4000	1300	1300
	Hyuga *	29,990	683	0	94	0	28	8	45,000 tur.	Nagasaki (Mitsubishi)	1917	1918								12 *14-in.*, 18 *5·5-in.*, 4 *3-in.* A.A., 2 M. H.A., 2 seaplanes, 1 catapult	6 (sub.) (D) *21-in.*	23	4500	1300	1360
	Ise *	29,990	683	0	94	0	28	8	45,000 B.C. tur.	Kobe (Kawasaki)	1916	1917	..	12 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 18 *5·5-in.*, 8 *5-in.* A.A., 2 M. H.A., 2 seaplanes	6 (sub.) (D) *21-in.*	23	4500	1300	1360
	Yamashiro §	29,330	673	0	94	0	28	6	40,000 B.C.T.	Yokosuka	1915	1917	..	12 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 16 *6-in.*, 8 *5-in.* A.A., 4 M., 4 L., 1 seaplane 1 catapult.	6 (sub.) *21-in.* (D)	22·5	4000	1300	1272
Kongo Class	Haruna §	29,330	704	0	95	0	27	6	64,000 P.T.	Kobe (Kawasaki)	1913	1915	..	8–3 K.S.	2¾	6	..	10 K.S.	6 K.S.	8 *14-in.*, 16 *6-in.*, 8 *5-in.*, A.A., 4 M., 4 L. 3 seaplanes	4 (sub.) *21-in.*	26	—	4000	1250
	Kirishima ‡*	29,330	704	0	92	6	27	6	64,000 P.T.	Nagasaki (Mitsubishi)	1913	1915	..												
	Kongo ‡*	29,330	704	0	92	0	27	6	64,000 P.T.	Barrow	1912	1913	2,500,000												
Nagato Class	Mutsu †*	32,720	700	0	95	0	30	0	80,000 (G.)	Yokosuka	1920	1921	..	12–9 K.S.	3½	..	..	14	..	8 *16-in.*, 20 *5·5-in.*, 8 *5-in.* A.A., 3 M., 3 seaplanes	4 (sub.) 4 a.w. *21-in.*	23	1600	3400	1304
	Nagato † ‖									Kure	1919	1920													1367 (as fleet flag-ship)

New Construction. It is anticipated that Japan will lay down two 35,000 ton battleships in 1938.

Armoured Cruisers now rated as Coast-defence Ships (1st class), completed 1899–1904: Kasuga, 7080 tons, 20 knots, 1 10-in., 2 8-in., 14 *6-in.*; Yakumo, 9010 tons, 16 knots, 4 8-in., 12 6-in., 5 3-in.; Adzuma, 8640 tons, 16 knots, 4 8-in., 12 6-in., 5 3-in.; Idzumo and Iwate, 9180 tons, Idzumo, 20¾ knots, Iwate, 16 knots, 4 8-in., 14 6-in., 5 3-in.; Asama, 9240 tons, 21½ knots, 4 8-in., 12 6-in., 5 3-in.; Tsushima (2nd class), 3120 tons, 20 knots, 6 6-in., 8 3-in., 1 3-in. A.A.

* Reconstructed 1936.

§ Modernised 1934.

‡ Modernised 1928–1931, including fitting of bulges and new foremast, and conversion to oil burning. Hiyei of this class has been de-militarised and converted to a training ship in accordance with London Naval Treaty.

‖ Reconstructed 1935.

† Being modernised.

JAPAN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Side / Deck.	Gun Position.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft. ins.					£	in.	in.			knots.	tons.	
A.C.	**Akagi** *	26,900	763 b.p.	92	21 2	131,200 (G.)	Kure	1925	1927	..	..	..	10 *8-in.*, 12 *4·7-in.* A.A., capacity for 50 aircraft. Carries about 30 aircraft	—	28·5	4000	..
A.C.	**Hosho** †	7470	510 b.p.	48	15 0	30,000 (G.)	Tsurumi (Asano)	1921	1922	..	..	..	4 *5·5-in.*, 2 *3-in.* A.A., 26 aircraft	—	25	— / 2700	550
S.C.	**Kamoi** §	17,000	495	67	28 0	8,000 turbines and electric drive	New York S.B. Co.	1922	1922 (converted 1933)	..	..	..	2 *5·5-in.*, 2 *3-in.* A.A., 10 seaplanes	—	15	4000	..
A.C.	**Kaga** ‡	26,900	715 b.p.	102½	22 1	91,000	Kobe (Kawasaki)	1921	1928	..	..	..	10 *8-in.*, 16 *4·7-in.* A.A., capacity for 60 aircraft. Carries about 30 aircraft	—	23	— / 5300	..
S.C.	**Notoro** §	14,050	455 b.p.	58	26 6	5,850 recip.	Kobe (Kawasaki)	1920	1920	..	..	..	2 *4·7-in.*, 2 *3-in.* A.A., 16 seaplanes	—	12	— / 1000	..
A.C.	**Ryujo**	7100	548	60′ 8″	15 0	40,000 (G.)	Yokohama	1931	1933	..	..	..	12 *5·1-in.*, A.A., 24 aircraft	—	25	oil	600
A.C.	**Soryu**	10,050	688	68′ 4″	16 6	60,000	Kure Yokosuka	1935	Bldg. ..	..	..	..	12 *5-in.*, A.A.	—	30	..	..
A.C.	**Hiryu**							1936									
A.C.	**Koryu**							Bldg.									
S.C.	**Chitose**	10,000	..	..	..	..	Kure		..	..	..	..	..	—	..	..	..
S.C.	**Chioda**							Bldg.									
S.C.	**Mizuo**							Bldg.									

* Designed as a battle cruiser. † Fitted with gyro-stabiliser. ‡ Designed as a battleship. § Converted from oilers. Seaplane carriers. Other vessels carry landplanes.

JAPAN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
											Side. / Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. / Oil.	
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
	Tone	8500	614 3 w.l.	63·1	14·7	90,000	Nagasaka	Bldg.	..	..	..	..	15] 6·1-in., 8 5-in. A.A., 3 aircraft, 1 catapult	..	33	..	..
	Tikuma	8450						Bldg.					.. ..	..	33	..	..
Mogami Class	Mogami	8500	625 w.l.	59¾	14·9	90,000	Kure	1934	1935	2,500,000 estimated	..	..	15 6·1-in., 8 5-in. A.A., 2 catapults, 4 aircraft.	12 21-in. a.w. (T.)	33	..	..
	Mikuma						Nagasaki	1934	1935								
	Suzuya						Yokosuka	1934	1936								
	Kumano						Kawasaki	1936	1937								
Myoko Class	Chokai	9850	650	62½	16½	100,000 (G.)	Nagasaki	1931	1932	..	3 / —	..	10 8-in., 4 4·7-in. A.A., 2 M. 2 catapults, 4 seaplanes	8 21-in. a.w. (D.)	33	oil	692
	Maya						Kobe	1930									
	Atago						Kure	1930	1932								
	Takao						Yokosuka										
Nachi Class	Ashigara	10,000	640	62½	16½	100,000 (G.)	Kobe	1928	1929	..	3 / —	..	10 8-in., 8 4·7-in. A.A., 2 M., 2 catapults, 4 seaplanes	12 21-in. a.w. (T.)	33	— / 2500	692
	Haguro						Nagasaki		1929								
	Myoko						Yokosuka	1927	1929								
	Nachi						Kure		1928								
Furutaka Class	Kinugasa	7100	595	50¾	14¾	95,000 (G.)	Kawasaki, Kobe	1926	1927	..	..	..	6 8-in., 4 4·7-in. A.A., 2 M., 1—2 planes, 1 catapult	12 21-in. a.w.	33	400 / 1400	604
	Aoba						Nagasaki	1926	1927								
	Furutaka						"	1925	1926	..	..	..	6 8-in., 4 3-in. A.A., 2 M., 2 planes, 1 catapult				
	Kako						Kawasaki, Kobe	1925	1926								
Chikuma Class	Hirado	4400	475	46½	16¾	22,500 P.T.	Kobe	1911	1912	..	2½ / —	..	8 6-in., 2 3-in., 2 3-in. A.A., 2 M.	3 18-in. a.w.	26	900 / 300	410
	Yahagi						Nagasaki										
Natori Class	Abukuma	5170	535	47¾	15¾	90,000 (G.)	Uraga	1923	1925	..	2 / —	..	7 5·5-in., 2 3-in. A.A., 2 M., 1 seaplane, 1 catapult, 80 mines	8 21-in. a.w. (D.)	33·0	800 / 1260	450
	Isudzu						Uraga	1921	1923								
	Nagara						Sasebo	1922	1922								
	Natori						Nagasaki (Mitsubishi)	1922	1922								

Natori Class	**Yura**	5170	535	47¼	15¾	90,000 (G.)	Sasebo	1922	1923	..	2/—	..	7 *5·5-in.* 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult, 80 mines	8 21-in. a.w (D.)	33·0	300/1260	450
	Kinu						Kawasaki	1922	1922								
Sendai Class	**Jintsu**	5195	535	47¼	15¾	90,000 (G.)	Kawasaki	1923	1925	..	2/—	..	7 *5·5-in.*. 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult, 80 mines	8 21-in.	33·0	300/1260	450
	Naka						Yokohama	1925	1925								
	Sendai						Nagasaki	1923	1924								
Kuma Class	**Kiso**	5100	535	47¼	15¾	90,000 (G.)	Nagasaki	1920	1921	..	2/—	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 80 mines	8 21-in. a.w. (D.)	33·0	300/1260	439
	Kitakami						Sasebo	1920	1921								
	Kuma						Sasebo	1919	1920								
	Oi						Kobe	1920	1921								
	Tama						Nagasaki (Mitsubishi)	1920	1921								
Tenryu Class	**Tatsuta**	3230	468	40¾	13	51,000 (G.)	Sasebo	1918	1919	..	..	..	4 *5·5-in.*, 1 *3-in.* A.A., 2 M. Fitted for minelaying.	6 (T.)	31	—/900	332
	Tenryu						Yokosuka										
—	**Yubari**	2890	435 b.p.	39½	11¾	57,000 (G.)	Sasebo	1923	1923	..	..	..	6 *5·5-in.*, 1 *3-in.* A.A., 2 M. 34 mines	4 21-in. a.w. (D.)	33	—/820	328

* A replenishment programme of new construction is projected to cover a period of 3 or 4 years and comprising 3 cruisers (8500 tons), 3 aircraft carriers (10,000 tons), 14 destroyers (1400 tons), 6 submarines (of a total tonnage of 7500 tons), a minelayer (5000 tons), 8 torpedo boats.

MINELAYERS.—Katsuriki (1917), 1540 tons, 13 knots, 3 3-in., 150 mines; Itsukushima (Uraga, 1929), 1970 tons, 16 knots, 3000 H.P. (Diesel), 3 5·5-in., 2 3-in. A.A.; Tokiwa, 9240 tons, 21 knots, 2 8-in., 8 6-in., 3 3-in., and 17 smaller vessels, 300—400 tons, about 12 knots. Okinoshima (1936) 4400 tons, 9000 H.P., 20 knots, 4 5·5-in.

MINESWEEPERS.—Nos. 1, 2, 3 (1923), No. 4 (1925), and Nos. 5, 6 (1929), 615 tons, 20 knots, 2 4·7-in., 1 3-in. A.A. Nos. 9, 10 (1918), 770 tons, 24 knots, 2 4·7-in.; Nos. 13—14 (1933), and Nos. 15—18 (1935-36), 492 tons, 2 4·7-in. guns, and Nos. 19—24 are projected.

GUNBOATS.—Saga (1912), 685 tons, 15 knots, 1 4·7 in., 3 3-in. A.A.; Ataka (1922), 725 tons, 16 knots, 2 4·7-in., 2 3-in. A.A.; Yodo, 1320 tons, 22 knots, 2 3-in.

RIVER GUNBOATS.—Futami (1930), Atami (1929), 170 tons, 16 knots, 1 3-in. gun; Katata, Hira, Hodzu, Seta (1923), 305 tons, 16 knots, 2 3-in. A.A.; Toba (1911), 215 tons, 15 knots, 2 3-in.; and Kotaka (1930), 50 tons, 15 knots, 5 M.G.

SUBMARINE DEPÔT SHIPS.—Taigei (1934), 10,000 tons, 689 feet, 13,000 H.P., 20 knots, 4 5-in. A.A.; Chogei (1924), Jingei (1923), 5160 tons, 16 knots, 4 5·5-in.; Komahashi (1914), 1230 tons, 13·9 knots, 2 3-in., 1 3-in. A.A.; Karasaki (1896), 9750 tons, 13 knots, 1 3-in., 1 3-in. A.A.

ANTI-SUBMARINE NETLAYERS.—Yayeyama (1932), 1135 tons, 4800 H.P. (reciprocating machinery), 20 knots, 2 4·7-in. A.A.; Shirataka (1929), 1324 tons, 16 knots, three 4·7 in. A.A. guns. Tsubane and Kamone (1929), 450 tons, 19 knots, 1 3-in. Matsushima, Sarusima and Nasami, 443 tons, 19 knots, 2 3-in. guns.

SUBMARINE CHASERS.—Three in No. 300 tons, 3400 H.P., 24 knots, machine guns and depth charges.

REPAIR SHIP AND SUBMARINE SALVAGE SHIP.—Asahi (ex-Battleship, 12,000 tons), 18 knots. Repair Ship—Akashi, building. Salvage Ships. Cable Ships. Transports and other auxiliaries.

ARMED OILER.—Takasaki (1937), 12,000 tons, 19 knots, 4 5-in. guns.

NETHERLANDS.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.		Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns	Torpedo Tubes.		Coal.	Oil.	
															Heavy Guns.	Second-ary.						
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons.		
cr.	**De Ruyter** . .	6450	560	51	16	66,000 P.T. Y.	Rotterdam (Wilton-Fijenoord)	1935	1936	..	2	1¼	..	..	..	..	7 *5·9-in.*, 10 *1·5-in.* A.A., 4 M, 1 catapult, 2 seaplanes	—	32		1000	450
cr.	**Java** * . . .	6670	509½	52½	18	72,000	Flushing .	1921	1925	..	3	..	1	..	4	..	10 *5·9-in.*, 6 *1·5-in.*, 4 *2-pr.*, 8 M., 40 mines, 2 seaplanes	—	31	—	1070	525
,,	**Sumatra** * . .						Amsterdam	1920	1926													
a.g.b.	**Brinio** . . .	540	172¼	28	9¼	1500 Diesel	Amsterdam .	1912	1914	..	2 K.S.	¾	..	..	..	..	4 *4·1-in.*, 2 M.	—	14	34	—	52
,,	**Friso** . . .							1912	1914													
,,	**Gruno** . . .							1913	1915													
c.d.s.	**Hertog Hendrik** § .	4371	317	50	19	6282 *t.* Y.	Amsterdam .	1902	1903	347,500	6 H.N.S.	2	..	..	10 H.N.S.	3 H.S.	2 *9·4-in.*, 6 *5·9-in.*, 4 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	1a.w. 2 sub 18"	16·5 *t*	710	—	347
,,	**Jacob van Heemskerck** †‖	4445	321½	50	19	6396 *t.* Y.	Amsterdam .	1906	1908	347,500	6–4 H.N.S.	2	..	..	10 H.N.S.	6 H.N.S.	2 *9·4-in.*, 6 *5·9-in.*, 6 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M., 2 seaplanes	—	16·5 *t*	520	—	351
cr.	**Tromp** . . .	3450	434	40¾	18	56,000	Amsterdam .	1937	..	..	2	1	..	..	..	..	6 *5·9-in.*, 4 *1·5-in.* A.A.	—	32½	—	860	290

Ships marked * above are in the East Indies Squadron. † Of little fighting value. § To be replaced in 1935. ‖ To be replaced in 1938.

GUNBOATS.—(Indian Military Marine): Soemba, Flores (1926–7), and Johann Maurits van Nassau (1933), 1457 tons, 15 knots, three 5·9 in., one 3-in. A.A., 2 M.

MINELAYERS.—Nautilus (1930), used for fishery protection, 800 tons, 14 knots, one 3-in., two 1-pr., 2 M.; Douwe Aukes & Van Meerlant (1922), 687 tons, 13 knots, three 3-in. A.A., 2 M., 130 mines; Medusa and Hydra (1911), 593 tons, 11·5 knots, three 3-in., one 1-pr., 1 M., 65 mines; a new vessel authorised and eight old vessels. Minelayers attached to Indian Military Marine: Krakatau (1924), 982 tons, 17 knots, two 3-in A.A., 2 M., 150 mines, 1 catapult, and 1 seaplane; Pro Patria (1923), 534 tons, 10 knots, one 3-in. A A., 2 M., 80 mines; Prins Van Oranje and Gouden Leeuw (1932), 1291 tons, 15 knots, two 3-in., and 1 aircraft.

MINESWEEPERS.—I.–IV., 200–235 tons; (for the Indian Military Marine): A, B, C, D (1930), 179 tons; and one 1600 tons building. Jan Van Amster (1937), 460 tons, and 7 similar vessels building.

SURVEYING VESSELS.—Eilerts de Haan, Hydrograaf, and in the Indian Military Marine, Tydeman, and Willebrord Snellius.

SUBMARINE DEPÔT SHIPS.—Cornelius Drebbel (1915), 688 tons, 170 H.P. (Diesel), 6 knots; and (in Indian Military Marine), 3 C.M.B.'s. (Thornycroft 1928).

OLD LIGHT CRUISER Gelderland (1900), 3512 tons, now used as gunnery training ship. OLD GUNBOATS (1877–9): Hefring, Braga, Tyr and Freyr, 244 tons, 7–8 knots.

POLICE AND CUSTOMS VESSELS.—Seventeen in No., armed with 2 3-in. guns.

NORWAY.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.		Coal. Oil.	
															Heavy Guns.	Second-ary.					
		tons.	ft.	ft.	ft.					£	in.	in.			in.	in.			knots.	tons.	
c.d.s.	**Eidsvold** **Norge**	4166	310¼	50½	17⅔	4500 Y.	Elswick	1900	1901	350,000	6 H.N.S.	2	..	..	6 H.N.S.	6 H.N.S.	2 *8·2-in.* 6 *5·9-in.*, 8 *3-in.*, 2 *3-pr.*	2 (sub.) 18-in	16·5	550 —	270
„	**Harald Haarfagre** .	3858	304	48½	17⅔	4500	Elswick	1896	1898	300,000	7 H.S.	2	..	..	8 H.S.	..	2 *8·2-in.*, 6 *3-in-*	3 18-in. 2 (sub.) 18-in.	16·5	550 —	249
„	**Tordenskjold***							1897	1899								2 *8·2-in.*, 6 *4·7-in.*, 6 *3-in.*, 2 *3-in.* A.A., 6 M.				

Fishery Protection Vessels: Fridtjof Nansen (1931), 1050 tons, 15 knots, 2000 H.P., two 4-in., two 2-pr.; Heimdal (1892), 660 tons, 12 knots; four 12-pr.; and Michael Sars; 2 armed trawlers building. Minelayers: Fröya (1918), 760 tons, 22 knots, 4 4-in., 100 mines; Glommen and Laugen (1918), 335 tons, 9½ knots, 150 mines; old gunboats, refitted as minelayers, Tyr, Gor, Vidar, Brage, Nor, Vale, and Uller, 230–280 tons, armed with one 4·7-in. and other guns. Olav Trygrason,†† minelayer and training ship, built at Horten, 1600 tons, 21⅜ knots, 6000 H.P., 4 4·7-in. and 1 3-in. A.A. guns, and 2 T.T.s. (18 in.), 280 mines. Submarine Depôt Ship, Sarpen, 187 tons, 9 knots, two 9-pr. and one 1-pr. Cable Ship, Telegraf (1895).

Four sloops (1400 tons) and six minelayers, 500 tons, are projected, but no money has yet been voted.

* Employed as training ship for Cadets.

†† 1500 H.P. Diesels, 4500 H.P. turbines. Max. speed on Diesels, 14 knots.

SOVIET UNION.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power.	Where Built.	Makers of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel.	Complement.
												Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.		Coal. Oil.	
																Heavy Guns.	Second-ary.					
		tons.	ft.	ft.	ft.							in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Paris Commune (*ex*-Sevastopol) †	23,000	594	87	27½	42,000 ‡	Baltic Works	Baltic Works	1911	1915	..	9–5	3	..	..	12–10	6	12 *12-in.*, 16 *4·7 in.*, 10 *3-in.* A.A., *and smaller*, 1 aircraft.	4 (sub.) 18-in.	23	2000 1000	1125
b.	October Revolution (*ex*-Gangut)	23,000	594	87	27½																	
b.	Marat (*ex*-Petropavlovsk)	23,606	594	87	31																	
b.	Mikhal Frunze	23,000	594	87	27½				1911	1915												

† 1 aircraft.

‡ These ships are being modernised; underwater protection and re-engining.

Aircraft Carrier.

A.C. Stalin (building).

SOVIET UNION.—Cruisers.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
											Belt. / Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal / Oil	
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
cr.	**Admiral Istomin** * .	7600	..	..	..	..	..	..	Bldg.‡	..	..	..	.. ..	..	..	..	..
cr.	**Aurora** (*ex*-S.S.S.R) † .	6730	416	55	21	11,600	Petrograd	1900	1903	..	..	..	10 *5·1-in.*, 5 *6-pr.* A.A., 2 M.	..	18	964 / —	573
m.cr.	**Marti**	3500	..	..	..	..	..	..	..	..	..	..	.. ..	..	..	..	..
cr.	**Chevonnaya-Ukrainia** (*ex*-Ad. Nakhimov)	7600	507¾	50⅓	18½	50,000	Nikolaev	1915	1923	..	..	..	15 *5·1-in.*, 4 *3-in.*, 8 *3-in.* A.A., 4 M., 100 mines, 1 flying boat	12	29½	540 / 690	600
”	**Komintern** † . . (*ex*-Pamyat Merkuriya)	6675	440	54½	20½	19,500	Nikolaev	1903	1907	..	..	..	10 *5·1-in.*, 4 *3-in.*, 4 *6-pr.*, 1 aircraft	2 (sub.)	23	1190 / —	595
”	**Krasni Kavkaz** § (*ex*-Ad. Lazarev)	7600	535	51½	19	60,000	Nikolaev	1916	1930	..	3 / 1	3	4 *7·1-in.*, 4 *3-in.* A.A., 4 *4-in.* A.A., 4 M., 100 mines, 2 seaplanes	(a.w.)	29½	540 / 690	650
”	**Profintern** (*ex*-Svietlana)	7200	507	50⅓	18½	50,000	Reval	1915	1925	..	3 / 1	3	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 2 aircraft	(a.w.)	29½	540 / 690	..
”	**Voroshilov** (*ex*-Ad. Grieg)	7200	507¾	50⅓	18½	50,000	Leningrad	1915	1930	..	..	..	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 2 aircraft	(a.w.)	29½	540 / 690	..

* Renamed Krasni-Moryak and converted to seaplane carrier. 3 cruisers and 2 in No., 35,000 ton battleships projected.

† Training ship.

‡ Originally designed as sister ships to Krasni Kavkaz, launched in 1914.

7 cruisers and 6 light cruisers are projected, 4 sloops, 36 gunboats, 4 river gunboats, 38 minesweepers, 40 despatch vessels, about 150 C.M.B.s (some may be building), some submarine chasers, 9 oil transport vessels, 23 depot ships, 27 ice-breakers, 2 coastguard vessels, 761 tons, 4-in. guns, and miscellaneous other craft are projected.

SPAIN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.		Armament.		Speed.	Fuel.	Complement.
											Side. / Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. / Oil.	
		tons.	ft.	ft.	ft.					£	ins.	ins.			knots.	tons.	
b.	**Jaime I.**	14,224	459¼	78¾	25½	20,000 P.T. Y.	Ferrol	1914	1921	..	8–5 K.S. 2–1	10 (heavy) 3 (sec.)	8 *12-in.*, 20 *4-in.*, 2 *3-pr.*, 2 *3-in.* A.A., 2 M.	—	20·2 t	1850 / 20	854
l. cr.	**Canarias**	10,000	636	64	17·4	90,000 P.T.(G.) Y.	Ferrol	1931	1934	..	4 / 3	1	8 *8-in.*, 6 *4·7-in.*, 4 *4·7-in.* A.A., 8 *2-pr.* A.A., 2 seaplanes; 1 catapult.	12 21-in. (T.)	33·0	— / 2750	700
„	**Baleares**							1932									
„	**Miguel de Cervantes**	7475	579½	54	16½	80,000 P.T.(G.) Y.	Ferrol	1928	1930	..	3 / —	..	8 *6-in.*, 4 *4-in.* A.A., 2 *3-pr.*, 1 M.	12 21-in. (T.)	33·0	— / 1680	560
„	**Almirante Cervera**							1925	1928								
„	**Libertad** (*ex*-Principe Alfonso)							1925	1927								
„	**Navarra,** *ex*-**Republica** (*ex*-Reina Victoria Eugenia)	4857	462	50	15¾	25,500 P.T.	Ferrol	1920	1923	..	3–1½ / —	3	9 *6-in.*, 4 *3-pr.* A.A., 1 *3-in.*, 4 M. 1 L.	4 21-in.	25·5	1200 / 230	404
„	**Mendez Nuñez**	4509	462	46	14½	45,000	Ferrol	1922	1924	..	3	..	6 *6-in.*, 4 *3-pr.* A.A., 4 M.	12 21-in. (T.)	29	800 / 500	320
g.b.	**Eduardo Dato**	1314 (normal)	251½	33½	11¼	1700	Ferrol	1923	1925	..	..	..	4 *4-in.*, 2 *3-pr.*, 2 M.	—	15	324 / —	131
„	**Jose Canalejas**							1922	1924								
„	**Antonio Canovas del Castillo**							1922	1923								
„	**Lauria**	800 (normal)	213¾	30	9½	1100 Y	Cartagena	1912	1912	..	..	..	4 *4-in.*, 2 M.	—	14·0	148 / —	121
„	**Laya**							1911	1911								

Motor-launches, M 1, 2, 4, 5, 6; H 2, 3, 4, 40 tons. Sailing Training ships: Sebastian Elcano (1928), 3500 tons, 800 H.P. (Diesel), 9·5 knots; Galatea (*ex*-Clarastella) 1903), 2500 tons, bought in Italy. Nine armed trawlers (built in Britain). Eight fishery protection vessels. Three C.M.B.s. (*ex*-British).

Submarine salvage vessel Kanguro (1917), 2750 tons, 10 knots, four 2-pr. Oiler Pluton. Survey vessels Tofino, Malaspina, 1200 tons.

Three coastguard patrol vessels, 250 tons, authorised; and three fishery protection vessels are projected.

Minelayer Vulcano, 2100 tons (1936) 264 mines and 6 similar vessels.

SWEDEN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.		Coal. / Oil.	
															Heavy Guns.	Second-ary.					
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.d.s.	**Aran**	3361	287	49¼	16·7	7000 Y. *t*	Gothenburg	1901	1902	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·2 *t*	300 —	287
”	**Drottning-Victoria**	7000	396·7	61	21½	22,000 (G.) Y.	Gothenburg	1917	1921	666,000	8–6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 4 *3-in.*, 2 *6-pr.*, 9 M.	—	23·0	690 98	450
a.c.	**Fylgia**	4200	378	48·6	20·6	12,444 Y. *t*	Stockholm	1905	1907	385,700	4 K.S.	2	..	..	5 K.S.	5 K.S.	8 *5·9-in.*, 10 *6-pr.*, 2 *1-pr.*	2 sub. 18-in.	22·7 *t*	900 —	328
Hangar Cruiser	**Gotland**	4700	442	50·6	14·7	33,000 (G.)	Gothenburg	1933	1934	910,000 (estimated)	..	..	..	..	..	..	6 *6-in.*, 4 *3-in.* A.A., 4 M., 100 mines, 8 aeroplanes, 1 catapult	6 21-in.	27·0	oil	453
c.d.s.	**Gustav V.**	7000	396·7	61	21½	22,000 (G.) Y.	Malmö	1918	1922	666,000	8–6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 *11-in.* 8 *5·9-in.*, 4 *3-in.* A.A., 2 *6-pr.*, 2 M.	—	23·0	690 98	450
”	**Manligheten**	3361	287	49¼	17·4	7400 Y.	Malmö	1903	1904	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·0	300 —	287
”	**Oscar II**	4250	313·6	50·5	18	9000 Y.	Gothenburg	1905	1907	..	6 K.S.	2	6 K.S.	6 K.S.	7½ K.S.	5 K.S.	2 *8·3-in.*, 8 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	18·0	500 —	330
”	**Sverige**	6899	392·7	61	21½	20,000 tur. Y.	Gothenburg	1915	1917	666,000	8–6 K.S.	1½	4 K.S.	..	8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 4 *3-in.*, 2 *6-pr.*, 2 M.	—	22·5	690 98	450
”	**Tapperheten**	3361	287	49¼	17·7	6000 Y.	Malmö	1901	1903	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	16·5	300 —	287
”	**Wasa**	3361	287	49¼	17	6500 Y.	Stockholm	1901	1902	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	17·2	300 —	287

Drottning-Victoria, Gustav V. and Sverige have been reconstructed and modernised (1929–33). Two older coast-defence ships, Oden, Thor (1897, 1899) (reconstructed 1915–16), 3297 tons, 16½ knots, 5500 H.P. 2 10-in., 6 4·7-in., 8 6-pr. guns, to be used as depôt ship for flying-boats. Minelayer Class Fleming,* 1570 tons, 4 4·7-in., 20 knots, 100 mines; Vedette boats (employed as minesweepers), Sökaren, Sveparen, Sprängeren (1918), and 12 others, to be fitted as minelayers. Jagaren, Kaparen, Snapphanen and Väktaren, 250 tons, 177 ft. long, 27 knots, 2 3-in. Gunboat Svensksund (1891), 354 tons. Depôt ship for submarines, Svea (1886), 3300 tons, 4 4·7 in. Aircraft depôt ship Dristigheten (1901), 3620 tons. Depôt Ships:—Niord (1898), 3297 tons; Göta, 3350 tons. Jacob Bagge, Örngy, 738 tons, 20 knots, 2 4·7-in. guns. Sailing training ships: Af. Chapman, Najaden, Jarramas and Falken (1877–1900). Six in number surveying vessels. 4 minesweepers and 1 coast defence ship included in 1935–36 programme.

* **Reported to be having Diesels fitted.**

UNITED STATES.—Battleships.

Class.	NAME	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost. §	Armour.						Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. Heavy Guns.	Gun Position. Second-ary.	Guns.	Torpedo Tubes.			
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Washington																				
b.	North Carolina .	35,000	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9 *16-in.* guns, *5-in.* secondary armament, *5-in.* A A., 3 aircraft	..	about 30 knots	..	..
b.	Two projected .																				
b.	**Arizona** † .	32,600	608	106¼	27½	33,376 B. & W. P. tur.	New York . (Navy Yard)	1915	1916	1,485,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	—	21·0	— 2322	1400
b.	**Arkansas** * .	26,100	562	106	26	30,000 P. tur.	New York (S.B. Co.)	1911	1912	964,000	11–5 K.S.	3	..	8–6 K.S.	11 K.S	6½	12 *12-in.* (50 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	20·5	— 5100	1480
b.	**California** .	32,600	624	97½	30½	26,800 tur. electric drive	Mare Island (Navy Yard)	1919	1921	2,620,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 M., 2 *1-pr.*, 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— 4656	1412
b.	**Colorado** .	32,500	624	97½	30½	27,300 B. & W. tur. electric drive	New York (S.B. Co.)	1921	1923	1,383,000	13½–12 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— 4570	1407

b.	**Idaho** ‡ .	. 33,400	624	106¼	29½	40,000 B. & W. P.T.	New York (S.B. Co.)	1917	1919	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 float planes	2 (sub.) 21-in.	21½	— 3271	1374
b.	**Maryland**	. 31,500	624	97½	29¾	27,300 B. & W. tur. (G.) and electric drive	Newport News	1920	1921	1,383,000	18½–12 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— 4570	1410
b.	**Mississippi** ‡ .	. 33,000	624	106¼	29¼	40,000 B. & W. C.T. (G.)	Newport News	1917	1917	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— 3271	1374

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* See note * on p. 239.

† See note † on p. 239.

‡ Modernised, 1934. (See ‡, p. 239.)

§ The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

UNITED STATES.—Battleships—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour.						Armament.		Speed.	Fuel. Coal. / Oil.	Complement.
											Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position.		Guns.	Torpedo Tubes.			
															Heavy Guns.	Second-ary.					
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**Nevada** § .	29,000	583	108	27½	25,000 Y. P. tur.	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½–8 K.S	1½–3	..	13½ K.S.	18–16 K.S.	..	10 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	—	20·5	— 2000	1320
b.	**New Mexico** ‡	33,400	624	106¼	29½	40,000 B. & W. Electric drive	New York . (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·5	— 3271	1414
b.	**New York** * .	27,000	573	106	26	28,100 B. & W. recip.	New York . (Navy Yard)	1912	1914	1,315,114	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	21·0	— 5200	1450
.	**Oklahoma** § .	29,000	583	108	28½	25,300 B. & W. recip.	New York . (S.B. Co.)	1914	1916	2,200,000	13½–8 K.S.	1½–3	..	13½ K.S.	18–16 K.S.	..	10 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	—	20·5	— 2000	1320
b.	**Pennsylvania** †	33,100	608	106¼	28	40,000 B. & W. Cur. tur.	Newport News	1915	1916	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes.	—	21·0	— 2300	1380
b.	**Tennessee** .	32,300	624	97½	30¼	26,800 B. & W. Tur. electric drive.	New York (Navy yard)	1919	1920	2,620,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— 4656	1412

b.	**Texas***	27,000	573	106	26	28,100 recip.	Newport News	1912	1914	1,166,000	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	21·0	— 5200	1450
b.	**West Virginia**	31,800	624	97½	30	27,300 B. & W. tur. electric drive.	Newport News	1921	1923	1,383,000	13½–1 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— 4570	1407

Battleship Utah was converted to a mobile target ship in 1931 in accordance with the London Naval Treaty, and the battleship Wyoming was converted to a training ship (speed 18 knots) in 1931 in accordance with London Naval Treaty.

* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against aerial attack, conversion to oil burning, installation of 3-in. A.A. battery, and addition of catapults. Cost about £600,000 each ship. Displacement increased about 3000 tons.

† Modernised in 1931. Modernisation included fitting bulges, reboilering, increasing elevation of turret guns, replacing former anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control.

‡ Taken in hand for modernisation 1931. New Mexico and Mississippi completed 1933. Idaho completed 1934. **Modernisation includes fitting, increased** deck protection increasing elevation of turret guns, installation of eight 5-in. A.A. guns, reboilering, fitting of new turbines (the electric drive in New Mexico has been replaced by turbine machinery), alterations to masts and bridges, and fitting of bulges.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery.

The modernisation of California, West Virginia, Colorado, Maryland, and Tennessee is projected.

UNITED STATES.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
A.C.	**Wasp**	14,700	688 (on W.L.)	80	20	..	Bethlehem S. B. Co.	..	Bldg.	about 4,000,000	..	..	.. ..	..	.. ..	..	..
A.C. A.C.	**Yorktown** **Enterprise**	19,900	762 (on W.L.)	83	21¾	120,000	Newport News	1936	1937 est. 1938	..	..	..	8 *5-in.* A.A. guns, 100 aircraft	..	34	..	..
A.C.	**Ranger**	14,500	769	80	19⅔	53,500 (G.)	Newp't News S. B. Co.	1933	1934	about* 4,000,000	..	..	8 *5-in.* A.A., 76 aircraft	..	29¼	Oil	1434
A.C.	**Lexington**	33,000	880	104	31¼	180,000 tur. electric	Bethlehem S. B. Co. (Fore River)	1925	1927	9,000,000	..	..	8 *8-in.* (55 cal.), 12 *5-in.* (25-cal.) A.A. 4 *6-pr.* Operates about 80 land-planes	..	33½	7100	1670 *ex* Air
A.C.	**Saratoga**	33,000	888	106	31	180,000 tur. electric	N.Y. Ship-building Co.	1925	1927	9,000,000	..	..		..	33½	7100	
A.C.	**Langley** †	11,500	542	65½	19	7,200 tur. electric	Mare Island Navy Yard	1912	1922 as aircraft carrier	..	..	..	4 *5-in.* (51 cal.), operates 7 land-planes	—	15	— 2000	411

For particulars of Aircraft Tenders and Repair Ships, see page 258.

* The estimated cost has been increased from 19 million dollars to 21 million dollars to allow for the conversion of the vessel from a "flush-deck" type of carrier to an "island" type of carrier during construction.

† Formerly Collier Jupiter, converted 1937 into aircraft tender.

UNITED STATES.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
Phœnix Class	Phœnix	10,000 estimated	600 (on W.L.)	61 6	19 9	..	N.Y.S. Co., Camden	..	est. 1938	2,395,000	..	..	.. ..	..	..	..	..
	Boise						Newport News	1936		2,330,000	..	..	15 *6-in.*, 8 *5-in.*	..	32	..	..
	Honolulu						N.Y. Navy Yard	1937		..	..	..	.. ..	..	..	..	..
	St. Louis						Newport News	..	est. 1939								
	Helena						N.Y. Navy Yard	..									
Wichita Class	Wichita	10,000 estimated	600 (on W.L.)	61½	19¾	..	Philadelphia Navy Yard	1937	est. 1938	..	..	..	9 *8-in.*, 8 *5-in.* A.A., 2 *3-pr.*, 10 smaller, 2 catapults, 4 aircraft.	None	..	..	..
Brooklyn Class	Savannah	10,000 estimated	600 (on W.L.)	61½	19¾	95,000	N.Y.S. Co., Camden	1937	est. 1938	2,410,000 estimated	..	..	15 *6-in.*, 8 *5-in.*, A.A.	..	32	..	..
	Nashville						N.Y.S. Co., Camden	1937									
	Brooklyn						New York Navy Yard	1936	1937								
	Philadelphia						Philadelphia Navy Yard	1936	1937								
Quincy Class	Vincennes	9,400	575	61¾	19½	107,000	Bethlehem S. B. Corp., Quincy	1936	1937	2,410,000 estimated	..	..	9 *8-in.* guns, 8 *5-in.* A.A., 2 *3-pr.*, 10 smaller, 2 catapults, 4 aircraft	..	32·7	..	..
	Quincy							1935	1936	1,860,000 estimated							

Astoria Class	**Tuscaloosa**	9975	588	61¾	19½	107,000 (G.)	New York, S. B. Co.	1933	1934				9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., and 10 smaller, 2 catapults, 4–6 aircraft, 50 mines	None	32½	oil	**602**
	San Francisco	9950					Mare Island Navy Yard			2,090,000 estimated							
	New Orleans	9950					New York Navy Yard			2,460,000	5 — 3						
	Astoria	9950					Puget Sound Navy Yard			2,460,000	5						
	Minneapolis	9950					Philadelphia Navy Yard			2,460,000	6						
Portland Class	**Portland**	9800	610¼	66	17½	107,000 (G.)	Bethlehem S. B. Co. Quincy	1932	1933	2,210,000			9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., and 10 smaller, 2 catapults, 4–6 aircraft	6 21-in.	32½	oil	**602**
	Indianapolis	9950					New York S. B. Co.	1931	1932	2,250,000							
Chester Class	**Northampton**	9050	600¼	65	16·3–17·6	107,000 P.T. (G.)	Bethlehem S. B. Corp., Quincy	1929	1930	2,180,000	3 — ..	..	9 *8-in.* (55 cal.), 4 *5-in.* (25 cal.) A.A., 2 *3-pr.*, 2 catapults, 4·6 seaplanes	6 21-in. (T)	32½	oil	**611**
	Chester	9200		65			American Brown Boveri Elec. Corp.	1929	1930	2,230,000							
	Louisville	9050		66			Puget Sound Navy Yard	1930	1931	2,290,000							
Augusta Class	**Chicago**	9300		68			Mare Island Navy Yard	1930	1931	2,280,000							
	Houston	9050		65			Newport News S. B. & D. D. Co.	1929	1930	2,170,000							
	Augusta	9050		66				1930	1931	2,170,000							
Omaha Class	**Cincinnati**	7050	555½	55⅓	13½	90,000 P.T. (G.)	Tacoma, Wash.	1921	1924	1,730,000	3 — ..	..	12 *6-in.* (53 cal.) (Cincinnati and Detroit, 10 *6-in.*), 4 *3-in.* (50 cal.) A.A., 2 *3-pr.*, 2 catapults, 2 aircraft	6 21-in. (T)	33·7	— 1800	**450**
	Concord						Philadelphia (Cramp)			1,742,000							
	Detroit	7050	555½	55⅓	13½	90,000 C.T. (G.)	Bethlehem S. B. Co. Quincy	1922	1923	1,584,000	3 — ..	..					

UNITED STATES.—Cruisers—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour.		Armament.		Speed.	Fuel.	Complement.
											Belt. Deck.	Gun Position.	Guns.	Torpedo Tubes.		Coal. Oil.	
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
Omaha Class	Trenton	7050	555½	55⅓	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1923	1924	1,823,000	3 ..	..	12 *6-in.* (53 cal.) (Marblehead, 11 *6-in.*), 4 *3-in.* (50 cal.) A.A.; 2 *3-pr.*, 2 catapults, 2 floatplanes	6 21-in. (T.)	33·7	— 1800	450
	Marblehead								1924	1,810,000							
	Memphis							1924	1925	1,838,000							
	Milwaukee						Tacoma, Wash.	1921	1923	1,794,000							
	Omaha	7050	555½	55⅓	13½	90,000 P.T. (G.) (Raleigh) C.T. (G.)	Tacoma, Wash.	1920	1923	1,823,000	3 ..	..	10 *6-in.* (53 cal.) (Omaha, 12 *6-in.*), 4 *3-in.* (50 cal.) A.A.; 2 *3-pr.*, 2 catapults, 2 floatplanes	6 21-in. (T.)	33·7	— 1800	450
	Raleigh						Bethlehem S.B. Co., Quincy	1923	1924	1,616,000							
	Richmond						Philadelphia (Cramp)	1921	1923	1,742,000							
Pensacola Class	Salt Lake City	9100	585½	64	16	107,000 P.T. (G.)	New York S.B. Co.	1929	1929	3,400,000	3 ..	..	10 *8-in.* (55 cal.), 4 *5-in.* (25 cal.) A.A., 2 *3-pr.*, 2 catapults, 4 planes	6 21-in. (T.)	32½	— 3000	603
	Pensacola.						Navy Yard, New York	1929	1930								

GUNBOATS.—Tulsa (1923), and Asheville (1920), 1270 tons, 12 knots, 3 4-in., 2 3-pr., 3 1-pr.; Sacramento (1914), 1140 tons, 12½ knots, 3 4-in., 2 3-pr., 2 1-pr.; and 6 others, used for training purposes; Charleston, and Erie, 2000 tons, 4 6-in. guns, 20 knots.

RIVER GUNBOATS.—Guam (1927), Tutuila (1928), 370 tons, 14 knots, 2 3-in., 8 M.; Palos, Monocacy (1914), 180 tons, 13¼ knots, 2 3-in.; Luzon, Mindanao (1928), 560 tons, 16 knots, 2 3-in.

MINELAYERS.—Yosmite *ex*-San Francisco (1890), 3700 tons, 19 knots, 3 5-in., 2 6-pr., 2 3-in. A.A., 300 mines; Baltimore (1889), 3950 tons, 20 knots, 4 5-in., 4 6-pr., 2 3-in. A.A., 2 1-pr., 300 mines; Aroostook and Oglala (1918), 4200 tons, 20 knots, 1 5-in., 2 3-in. A.A., 350 mines; 8 light mine-layers, *ex*-T.B.D.'s., mounting 4 4-inch guns.

MINESWEEPERS.—27 in number, "Bird" class (1918, 1919), 840 tons, 1400 H.P., 14 knots, 2 3-in. A.A. guns authorised but not carried. 6 more are equipped as submarine salvage vessels (Chewink, Falcon, Mallard, Ortolan, Pigeon and Widgeon, built 1914–18, 1210–1270 tons, 14 knots).

AIRCRAFT TENDERS.—Patoka (1919), 16,800 tons, 10·9 knots, 2 5-in.; Heron (minesweeper) (1918), 950 tons, 14 knots, 2 3-in. A.A.; Jason (1913), 19,250 tons, 14·3 knots, 4 4-in., 27 planes. Aroostook (1918) (minelayer), 4950 tons, 20 knots, 1 5-in., 2 3-in. (can carry 350 mines); Argonne (1921), 9005 tons, 15 knots, 4 5-in.

AIRCRAFT REPAIR SHIP.—Wright, 9553 tons, 15 knots, 6000 H.P., 2 5-in., 2 3-in. A.A., 20 planes.

DESTROYER TENDERS.—Dobbin (12,450 tons); Whitney (12,450 tons), and Melville (7150 tons), 16 knots, 8 5-in., 4 3-in.; Altair, Denebola and Rigel, 7,600 tons, 10½ knots, 4 5-in., 4 3-in. A.A.; Black Hawk, 8900 tons, 13 knots, 4 5-in.; Bridgeport, 11,750 tons, 12½ knots, 8 5-in.

SUBMARINE TENDERS.—Holland (1926), 11,570 tons, 16 knots, 8 5-in., 4 3-in. A.A., 2 6-pr.; Bushnell (1915), 2896 tons, 14 knots, 4 5-in.; Canopus (1919), 6615 tons, 13 knots, 2 5-in.; Camden (1900), 7596 tons, 12 knots, 4 4-in.; Beaver (1910), 5320 tons, 16½ knots, 4 5-in.

REPAIR SHIPS.—Medusa (1924), 8125 tons, 16 knots, 4 5-in., 2 3-in. A.A., 2 6-pr.; Vestal, Prometheus (1909), 6625 tons, 16 knots, 4 5-in., 1 3-in. **25 submarine chasers** (80 tons), mounting 1 3-in. gun. TRAINING SHIPS.—Wyoming (1912), 26,000 tons, demilitarised.

5 Store ships, 6 Cargo ships, 3 Transports, 2 Hospital ships, 25 Patrol vessels (Eagle class, 430 tons, 18 knots, 2 4-in., 1 3-in. A.A.), Craneship; Kearsage (capacity 250 tons), 2 ammunition ships, and other auxiliaries, 18 oilers.

SHIPS OF THE LESSER NAVIES.

Albania.—Four motor launches, Durres, Tirane, Vlone and Siranda (built in Italy, 1928), 40 tons, 14 knots.

Austria.—River Patrol vessel: Birago (*ex*-Fogas) (1915), 62 tons, 16 knots. Motor Launches: Krems, Murr, Salzach, Emms, Drav, 46 ft. in length, 2 M.; Gazelle, 30 ft. in length.

Bulgaria.—Under the terms of the naval clauses of the Peace Treaty, Bulgarian warships of all classes, existing or under construction, were surrendered to the Allied and Associated Powers or broken up. All vessels are under the Ministry of Commerce for police and preventive duties; six torpedo boats (100 tons, 28 knots), two minesweepers (ex French), and six motor boats of little value.

China.—Cruisers: Ping Hai (Shanghai, 1932), 2500 tons (360 ft.×39 ft.×12 ft.), 10,500 H.P., 24 knots, six 5·5-in., six 3·4 in. and eight machine guns, four 21-in. torpedo tubes in pairs. Carry two seaplanes; Chao Ho and Ying Jui, built by Vickers Armstrong 1912, 2500 tons, 6000 H.P., 20 knots, two 6-in., four 4-in., two 3-in., six 3-pr., two 2-pr. A.A. and two 1-pr., two single 18-in. torpedo tubes; Hai Yung, Hai Chen and Hai Chou, built at Stettin 1898, 3000 tons, 7500 H.P., 19 knots, three 6-in., eight 4-in., four 3-prs. and smaller guns, mount one submerged 14-in. bow torpedo tube; Hai Chi (Elswick, 1898), 4300 tons, 17,000 H.P., 24 knots, two 8-in., ten 4·7-in., twelve 3-prs., six machine guns and four small guns, five 18-in. torpedo tubes. Tung Chi (Foochow, 1896), now used as a training cruiser, 1900 tons, 1600 H.P., 10½ knots, two 6-in., five 4-in. and eleven smaller guns. Sloops: Yat Sen (1931), 1650 tons, 4000 H.P., 20 knots, one 6-in., one 5·5-in., four 3-in. A.A., two 3-pr., four machine guns; Hsien Ning (Shanghai, 1928), 418 tons, 2500 H.P., 17 knots, one 4·7-in., two 3-in., three 6-prs., five machine guns; Yung Chien, Yung Chi (Shanghai, 1915), 870 tons, 1350 H.P., 13 knots, one 4-in., one 3-in., four 3-prs. and three smaller guns. Gunboats: Ming Chun (1930), 560 tons, 2000 H.P., 17 knots, one 4·7-in., one 4-in., one 3-in., and some smaller guns, including four machine guns. Yung Sui (Shanghai, 1929), 600 tons, 4000 H.P., 18 knots, one 6-in., one 4·7-in., three 3-in. A.A., and eight smaller guns; Ming Chen (Shanghai, 1931), 600 tons, 18 knots, one 4·7-in., one 4-in., two 3-in. A.A., and two 6-prs. Old Gunboats: Ta Tung and Tse Chion (1900), 900 tons, 6000 H.P., about 18 knots, two 4·7-in., one 3-in. and smaller guns; Chung Shan and Yung Hsiang (Kobe, 1913), 830 tons, 13½ knots, one 4-in., one 3-in.,; old gunboats Chu Yu, Chu Yiu, Chu Chien, Chu Kuan and Chu Tai (Kobe, 1907), 700 tons, 11 knots, two 4·7-in., two 3-in. and some smaller guns. Two torpedo boats (1912) of 390 tons, with 3-in. guns and two 18-in. torpedo tubes. Four torpedo boats of about 100 tons built in 1907, three 14-in. torpedo tubes. Ten patrol boats of 300 tons armed with 6 prs. Forty-two river gunboats. There are in addition a few gunboats and miscellaneous vessels belonging to the water police of Kwang Tung province. Two converted seaplane carriers (two seaplanes). One seaplane carrier, Teuck Shen, building. Eight motor torpedo boats built by Thornycroft, 1936, two torpedoes, two machine guns, 45 knots. The new construction programme is reported to include two cruisers, ten motor torpedo boats, four destroyers and four submarines. China at present has no submarines.

Colombia.—Gunboats: Presidente Mosquera, 200 tons; Cartagena, Santa Marta, Barranquilla (Yarrows, 1930), length 137½ feet, speed 13½ knots, two 3-in. A.A. The following two destroyers were purchased from Portugal early in 1934, Caldas and Antioquia (1934), 1282 tons, length 319 ft., beam 31 ft., speed 36 knots, four 4·7 in. guns, three 1½-in. A.A., and eight 21-in. torpedo tubes; built by Yarrow's in Portugal. River gunboats: Mariscal Sucre, 500 tons, Cordobo, 450 tons. Motor boats: Cauca (1913), 50 tons, four Guardacostas (Yarrow, 1913), 20 tons. Patrol vessels: Junin, Cairabosso and Pchincha, 200 tons, 13 knots.

Cuba.—Light cruiser, Cuba, 2055 tons, 6000 H.P. 18 knots, two 4-in., six 6-pr., two 3-pr., four 1-pr., 2 M. Training ship: Patria (1911), 1200 tons, 16 knots, two 3-in., four 3-pr. Gunboats: Habana, Pinar del Rio, Villas, Matanzas (1912), 80 tons, 12 knots, one 1-pr.; 24 de Febrero, 10 de Octubre (1911), 218 tons, 12 knots, three 3-pr.; Baire (1906), 500 tons, 14 knots, four 3-in., two 3-pr., 1 M.; Yara (1895), 450 tons, 12 knots, two 6-pr.; 20 de Mayo (1895), 200 tons, 12 knots, two 3-pr., two 1-pr.; Enrique Villuendas (1899), 178 tons, 16 knots, two 3-pr.: Captain Quevedo (1932), 137 tons, 12 knots, two 1-pr., one 3-in. A.A.

Czecho-Slovakia.—Patrol boats: President Masaryk (1932), 200 tons, 1600 H.P., 16·8 knots, four 3-in. A.A.; four in number, 17 tons, and four in number, 7 tons.

Ecuador.—Mine-laying patrol vessels Tarqui (50 tons), and gunboat Abdon Calderon, (*ex* Cotopaxi) (1884), 700 tons. Training ship: President Alfaro, 850 tons gross.

Egypt.—Three Patrol vessels. Five C.M.B.'s.

Estonia.—Mine-layers Keri and Vaindlo (1914), 50 tons, 9 knots, one 3-pr., minesweepers Sourop and Ristna, 500 tons, 12½ knots, one 3-in. gun, one 1-pr., two ice-breakers, and Peipus Lake gunboats Ahti, 144 tons, 10 knots, two 2-in. guns, and Tartu, 108 tons, 11 knots. Torpedo boat Sulev (*ex*-German A 32) (1917), 243 tons, 26 knots, two 3-in., 2 torpedo tubes, 10 mines; gunboat Laene, 400 tons, 12 knots, two 3-pr., river gunboat Mardus, two 3-in. guns. Two submarines, Lembit and Kalev, built at Vickers' 1936, 600 tons surface displacement, 820 tons submerged, 1200 H.P., 13½ knots on surface, 8½ knots submerged, one 40-mm. A.A. gun, four 21-in. torpedo tubes. Six C.M.B.'s are contemplated.

Finland.—Patrol boats Klas Horn (1892) (*ex*-Posadnik), 410 tons, 18 knots, Uusimaa (1919), and Hämeenmaa (1918), 400 tons, 15 knots, two 4-in. guns, Matti Kurki (1892) (*ex*-Voevoda); Karjala (1918) (*ex*-Filin), and Turunmaa (1918) (*ex*-Orlan), 342 tons, 15 knots, two 3-in. guns; 7 C.M.B.'s, 11–13 tons, 2 torpedo tubes; 7 ice-breakers, a minelayer (150 mines), 640 tons, and three minesweepers, and 21 motor launches. Two armoured gun-boats (4-in. belt), Väinämöinen and Ilmarinen, length 350 feet, 3900 tons, 5000 H.P. (Diesel-electric), 15 knots, four 10-in. guns, eight 4·7-in. guns, built at A/B Maskin and Brobyggnads, Abo (1932–3). Submarines Iku-Turso, Vetehinen and Vesihiisi (Abo, 1930), 490/700 tons, speed 14 knots surface, 9 knots submerged, one 3-in. gun, 20 mines, six 21 in, torpedo tubes; Saukko (Helsingfors, 1930), 100/136 tons, two 18-in. torpedo tubes, 9 mines; Vesikko (1933), 250/300 tons, 13/7 knots, four 21-in. torpedo tubes, one machine gun. Sailing training-ship Suomen Joutsen (*ex*-German Oldenburg). An ice-breaker is building and two minelayers are projected.

Hayti.—Special service vessels, Nord Alexis (1891), 1230 tons, two 4·7-in.; Veretieres (1889), 270 tons; 17 Decembre, 851 tons; Pacifique, 488 tons.

Hungary.—Patrol vessels: Sopron, Debreczen, 138 tons, two 3-in., 4 M., 15 knots, complement 44; Kecskemet, Szeged and Gyor, 131 tons, four 3-in., 4 M., 15 knots; also 12 motor launches.

Iceland.—Two fishery protection vessels.

Iraq.—Four in number motor patrol vessels, 100 ft. in length, 280 H.P., 12 knots.

Latvia.—Gunboat Virsaitis (*ex*-German M68), 480 tons, two 3-in., two 6-pr., one 3-in. A.A., one torpedo tube; 1 ice-breaker, Krisjanis Valdemars; 2 submarines (1927), Ronis and Spidola, $\frac{390}{514}$ tons $\frac{\text{surface}}{\text{submerged}}$ displ., $\frac{14\frac{1}{2}}{9\frac{1}{4}}$ knots, one 3-in. A.A., 2 M., 6 18-in. torpedo tubes; 2 mine-sweepers, Imanta, Viesturs, 225 tons, 14 knots, one 3-in. A.A., 4 M., 30 mines, completed in 1926; one submarine depot ship, Varonis, formerly an ice breaker, 10 knots; Surveying vessel, Hidrografs (1918), 10 knots.

Lithuania.—Patrol vessel: Prezidentas Smetone (1917), 500 tons, two 3-in. guns, 16 knots.

Manchukuo.—Gunboats Ting Pien, Chin Jen, Shun Tien and Yang Min, built by Harima Dock Co., Japan, 1934–35, 280 tons, 12 knots, 4·7-in. A.A. and A.A. machine-guns; gunboat Haifeng, 200 tons, 13 knots, and another similar. The following have been built recently by the Kawasaki Works at Harbin:—Tatung and Limin, 65 tons, 12 knots, 3 guns, Enmin, Huimin, Pumin, Onmin, Keimin and Fumin, 15 tons, 10 knots, 3 machine guns. The following vessels were launched at the beginning of 1933 at Yokohama, Daichi Kaihen and Daini Kaihen, 15 knots, 3 machine guns, and the river gunboats Daido and Rinni, 56 tons, 13 knots, one 6-in. gun. Coast-guard ships Kaiho, Kaisui, Katei, and Kaikwa, 45 tons; Chi Min (1934), 20 tons, 2 machine guns.

Mexico.—Coast defence vessel Anahuac (1898), 3162 tons, 15 knots, two 9·4-in., four 4·7-in., four 6-pr., 2 M., 2 L.; gun-vessels; Bravo 1227 tons; 3000 I.H.P.; 12¼ knots (Leghorn, 1904), two 4-in., four 6-pr.; G20–29 (1934–5), 130 tons, 3000 H.P., 26 knots, two 25 M.M. A.A. and four 13 M.M. A.A. Two armed transports, Zocateca and Durango, built in Spain, 1935, 1600 tons, 20 knots, 3000 miles endurance at 15 knots, two 4-in., two twin 1-in. pompoms, two four-barrelled ·5-in. machine guns, built to carry 500 men and 80 horses. Three others, Querataro, Potesi, and Guanajato, 1300 tons, 20 knots, three 4-in. and twelve machine guns, to transport 230 men and 20 horses. Patrol vessels: Tampico, Mazatlam, Acapulco, and Veracruz (1920), 486 tons, 8 knots, one 6-pr., and two M.G. Several transport vessels.

Paraguay.—Gunboats: Humayta and Paraguay (1931), 636 tons, 17 knots, four 4·7-inch, four 3-inch A.A. guns, six mines; two older, Capitan Cabral and Tacuari, 120 tons, completed 1910, two 3-in., two 6 prs., 10 knots. Two despatch vessels, with 3-in. guns and two vedettes.

Persia (Iran).—Gunboats; Babr and Palang (Italy, 1932), 950 tons, 205 feet long, 1900 H.P. (Diesel), 15 knots, two 4-in. and two 3-in. A.A. guns. Four motor patrol boats built in Italy (1932). Semorg, Chahbaaz, Karkas and Sharock, 330 tons, 900 H.P. (Diesel), 15 knots, two 3-in. guns. Several Italian built motor boats (1935), 28 tons, 68 feet in length. Gunboats and patrol vessels are for customs work.

Peru.—Almirante Grau and Coronel Bolognesi, cruisers 3200 tons; (Barrow, 1906); two 6-in., eight 3-in., eight maxim; 2 submerged torpedo tubes; 24 knots; converted to oil-burning 1925, to be fitted as minelayers; also Lima (1880, refitted 1920) (parent ship for submarines), 1790 tons, 10 knots, four 4-in. Gunboat America, 200 tons, 14 knots. Destroyer, Rodriguez, 490 tons, 28 knots. T.B.D.s, Almirante Guise (*ex*-Lennuk) (1917), 1400 tons, 35 knots, five 4-in. guns, one 2-pr., nine T.T., eighty mines, and Almirante Villar (*ex*-Vambola) (1918), 1260 tons, 35 knots, four 4-in. guns, two M., one 2-pr., nine T.T., eighty mines. Submarines R1–4, built in U.S.A. (1926–9), and R5 and R6 authorised, $\frac{576}{682}$ tons, $\frac{14\frac{1}{2}}{10}$ knots, one 3-in., 4 torpedo tubes. One vedette boat, the Napo, 98 tons, built by Yarrow, 1921, three 1·8-in., 12 knots. Gunboats: Amazonas and Loreto (1934), 250 tons, 750 H.P., 15 knots, four 1·5-in., two ·8-in., two M.G. Transport vessel: Rimac 6848 tons. (gross), 12 knots. Oiler: Pariñas, 2820 tons (gross), 10 knots.

Poland.—Five *ex*-German torpedo boats (355 tons, 20 knots, two 3-in., 18-in. torpedos) for police purposes. Gunboats Komendant Pilsudski and General Haller, 350 tons, 15 knots, built in Finland (1920). Training ship Iskra. Monitors Warszawa, Horodyszcze, Krakow, Wilno, Torun, Pinsk. Twenty motor boats. Two destroyers, Burza, Wicher, completed 1931–2 at Chantiers Navals Français, 1515 tons, 33,000 H.P., 33 knots, four 5·1-in., one 2·9-in. A.A., 6 torpedo tubes. Three submarine minelayers built in France, Rys, Zbik, and Wilk, completed 1931–2; $\frac{964}{1230}$ tons, $\frac{1800}{1200}$ H.P., 14 knots surface, 9 knots submerged; one 4-in., one 2-pr., 6 torpedo tubes, 40 mines. Minesweepers Jas Kolka, Mewa, Czajka, Rybitwa (1935), 183 tons, 1040 H.P. (Diesels), 15 knots, one 3-in. gun. A minelayer to carry 300 mines, Gryf, 2200 tons, 6000 H.P. (I.C.), 20 knots, six 4·7-in., two 3·5 in. A.A., two machine guns, is building in France. Two destroyers: Grom and Blyskavica, launched 1936, 2000 tons, 39 knots, seven 4·7-in., 2 triple torpedo tubes. Two submarine minelayers building in Holland, one 3·5-in. gun. River Monitors: Miedosciagnoma and Niezwyciezona (1934), 70 tons.

Portugal.—The minelayer Vulcano (151 tons) (Thornycroft, 1909). Two sloops, about 1200 tons, sold out of the British Navy, Carvalho Araujo (*ex*-Jonquil) and Republica (*ex*-Gladiolus), two 4-in., two 3-in. A.A. Destroyer Tamega (1913–24), 700 tons, 11,000 H.P., 27 knots, one 4-in., two 3-in., two torpedo tubes. Gunboats Damao and Zaire (1919), Diu and Lagos (1932), Faro (1928), 400 tons, 700 H.P., 13 knots, two 3-in., two 3-pr., and there are 18 older ones.

1st class sloops: Alfonso de Albuquerque and Bartolomeu Diaz (Hawthorn Leslie, 1935), 1760 tons, 21 knots, four 4·7 in., two 3-in. A.A., four pom poms, two torpedo tubes, one catapult, one aircraft, and 40 mines. 2nd class sloops: Goncalo Velho and Goncalves Zarco (Hawthorn Leslie, Newcastle, 1933), 1045 tons, 2000 H.P., 16½ knots, three 4·7-in., two 1·5-in. A.A. Pedro Nunes, completed 1933, and João de Lisboa (*ex*-Infante Henrique) (building at Lisbon), 1080 tons, 17 knots, two 4·7-in. Destroyers: Vouga and Lima (Yarrow's, Scotstoun, 1933), and Dao and Tejo (built by Yarrow's in Portugal, 1935), 1282 tons, 33,000 H.P., 36 knots, four 4·7-in., three 1·5-in. A.A., two quadruple 21-in. torpedo tubes, 22 mines. Submarines: Delfin, Espardate, and Golfinho (Vickers, 1934–1935); surface condition, 800 tons, 2300 H.P. and 16½ knots; submerged condition, 1000 tons, 1000 H.P. and 9½ knots; one 4-in. gun, six 21-in. torpedo tubes.

Two destroyers, Douro and Tejo, sister vessels to Dao, were bought by the Colombian Government and renamed Antoquia and Caldas (see Colombia), and replace vessels were built by the

Society of Constructions and by Naval Repairs Co., Lisbon; engines, boilers and all material supplied by Yarrows.

Other ships, including two light cruisers and an aircraft tender are projected.

Rumania.—*River Monitors.*—Bucovina (1916), 540 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Ardeal (1905), 440 tons, 10 knots, two 4·7-in., one 3-pr., one 3·5-in. A.A.; Basarabia (1915), 530 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Lascar Catargiu, Ioan Bratianu, Milhail Kogalniceanu, Alexandru Lahovari (1907–08), 670 tons, 13 knots, three 4·7-in., two 3-pr., one 3-in. A.A., 2 M.

Flotilla Leaders.—Regele Ferdinand and Regina Maria (Naples, 1930, Thornycroft's design), 1785 tons, 38 knots; length 334¾ ft., five 4·7-in., three 2-pr. A.A.; two twin torpedo tubes. Marasti, Marasesti (*ex*-Italian Nibbio, Sparviero), 1917–18, 1460 tons, 35 knots, five 4·7-in., four 3-in. A.A., 2 M., 2 twin torpedo tubes, 50 mines.

Four vedettes (built in 1908), 50 tons, 18 knots, one 3-pdr. gun.

Gunboats.—Stihi, Lepri Remus, Dumitrescu, Ghiculescu (1916–17, *ex*-French Magnonne, Friponne, Chiffonne, Impatiente), 350 tons, 15 knots, two 3·9-in., 2 M.

Submarine.—Delfinul (Quarnaro, Fiume, 1932). Displacement, 640 tons surface, 900 tons submerged; speed 14 knots surface, 9·5 knots submerged, one 4·2-in. gun, 6 torpedo tubes.

There are also five armed motor boats, police craft (*ex*-Austrian T.B.s) Naluca, Sborul, and Zmeul, and seven armed launches.

A submarine depôt ship, Constanta, 1821 tons, two 4-in. A.A. guns (Fiume 1930).

Training ship, Mircea, 350 tons, 8·5 knots, two 1-pr. Sailing with auxiliary engines.

Siam.—*Gunboats:* Monokut Rajakumarn (1887), 700 tons, 11 knots, two 4·7-in., two 6-pr., three 3-pr.; Srma Monthon (1908), 225 tons, 14½ knots, two 6-pr.; Ratnakosindr (1925), 920 tons, two 6-in., four 3-in. H.A., 12 knots; Sugrib (1900), 580 tons, 11·5 knots, one 4·7-in., five 6-pr., 2 M.; Sukhodaya (Vickers, 1930), 1030 tons, 13 knots, two 6-in., four 3-in. A.A. Two 380-ton, 27-knot destroyers, built at Kobe, Sua Gamron Sindhu and Sua Tayanchor. Phra Ruan (*ex*-British Radiant, 1917), 719 tons, 35 knots, three 4-in. Four torpedo boats (built in Japan, 1908–13), 90 tons, 22 knots, one 6-pr., one 3-pr. Six 55-ft. Thornycroft C.M.B.s, 37–40 tons, two torpedoes. Nine torpedo boats built in Italy, 1936–37 (460 tons), 32 knots, three 3-in. guns, six 18-in. torpedo tubes. Training ship Chao Phra (1919), 840 tons, 16 knots. Four 370-ton submarines are building in Japan. Two minelayers (1936), Italian built, 408 tons. Three patrol vessels (1936), built in Japan, 130 tons, fitted with torpedo tubes. Tug Pi-Sua-Maar, 165 tons, 9½ knots. Transports: Vides Kichkar (1902), 850 tons; Amgthong (1918), 15 knots; Oiler, Sumui (1936), 1854 tons. Fishery protection vessels (1936), 50 tons. Building programme includes two coast defence gunboats, two sloops, four submarines, 1 minelayer.

Turkey.—The old battleship Torghud Reis (*ex*-German Weissenburg, 1891), refitted 1927, 9842 tons, 17 knots, six 11-in., three 3-in., two 2·5-in. A.A., 2 submerged torpedo tubes. The battle-cruiser Yavouz Sultan Selim (1912) (*ex*-Goeben), 22,734 tons, 27 knots. Armament: ten 11-in., ten 5·9-in., eight 3·5-in., four 1·5-in. P.P., 2 M., 1 L., 4 submerged torpedo tubes. Light cruisers: Hamidieh (Elswick, 1904), 3830 tons, speed 22 knots; armament: two 5·9-in., six 3-in., eight 3-in. A.A., two 18-in. torpedo tubes, 70 mines; Medjidieh (Philadelphia, 1903), refitted 1927, 3300 tons, speed 22 knots, armament: four 5·1-in., two 3-in. A.A., 4 M. Destroyers: Adatepe, Kocatepe (Ansaldo, Italy, 1932), 1310 tons, 43 knots, four 4·7-in., three 2-pr. A.A. guns, six 21-in. tubes. Tinaztepe and Zafer (Cantiere Navale del Tirreno, Italy, 1932), 1840 tons, 38 knots, four 4·7-in. guns, three 2-pr. A.A., six 21-in. tubes. Submarines Ikindji-in-Uni and Birindjiin-Uni (Fijenoord, Rotterdam, 1928), $\frac{433}{556}$ tons, $\frac{13\frac{3}{4}}{9\frac{3}{4}}$ knots, one 3-in., 1 M., six 18-in. torpedo tubes. Dumlupinar (minelayer) (Monfalcone, 1932), 950 tons, 15 knots, 2400 H.P. surface, 1200 tons, 9½ knots, 1400 H.P. submerged, one 4-in. A.A., 4 torpedo tubes, 40 mines. Sakarya (Montfalcone, 1932), $\frac{610}{940}$ tons, 15 knots 1500 H.P. surface, 925 tons, 9½ knots, 1100 H.P. submerged, one 4-in., six 21-in. torpedo tubes. Three motor launches (1931), 32 tons, 34 knots, one 3-in., 2 torpedoes, 4 motor launches, 11 knots, 2 M. Reported that tenders are to be invited for two 8,000-ton cruisers to be built in Japan, four destroyers, and four 600-ton coastal submarines to be built at Rotterdam. Torpedo gunboats: Peikei-Shevket and Beru-i-Satwet (1906), 775 tons, two 4-in., four 6-pr., three 18-in. torpedo tubes. Minesweepers, 3 in number, 413 tons, three 3-in., two 3-pr., 14 knots. Minelayer, Yardim (1913), 360 tons, 15 knots, 25 mines.

Uruguay.—Torpedo-gunboat (training ship) Uruguay (1910), 1150 tons; two 4·7-in., four 3-in.; two 18-in. torpedo tubes. Suveying ship Capitan Miranda (1930), 516 tons. Training ship, 18 de Julio, 680 tons, 12 knots. Three coastguard patrols boats, Paysandu, Salto, and Rio Negro, built in Italy, 1935, 160 tons, 1150 H.P. (Diesel), 17 knots, two 3-in., two machine guns. Armed tugs Vanguardia (1908), 95 tons, 12 knots, two 1·5 in. Corsario, 130 tons, 10 knots, two 1·5 in.

Venezuela.—Old gunboats Mariscal Sucre (1125 tons), two 4-in., two 6-pr. General Salom (750 tons), one 3-in., four 6-pr., 12 knots. Miranda (200 tons), Brion (150 tons). Armed tug José Felix Ribas, two 6-pr. Armed yacht Maracay.

Yugoslavia.—Submarines Hrabri and Nebojsca, completed at Armstrong's 1928, displacement 870 tons surface, 1146 tons submerged; speed 15 knots surface, 10 knots submerged; mount two 4-in., six 21-in. torpedo tubes. Smeli and Osvetnik, completed at Nantes, 1929; displacement 570 tons surface, 797 tons submerged, speed

14·5 knots surface, 9·25 knots submerged, carry one 4-in., one 2-pr., and 6 torpedo tubes (21-in.). Two coastal motor boats, 38 knots, built at Thornycroft's, completed in 1927. Old cruiser Dalmacija (*ex*-German Niobe), refitted 1926, 2370 tons, six 3-in., is used as a gunnery and general training ship. There are four *ex*-Austrian river monitors, Vardar, Drava, Sava, Morava, 400–530 tons, mounting two 4·7-in. and smaller guns; eight *ex*-Austrian T.B.'s, 260 tons, 28 knots; two 2·5 in.; two patrol boats, 36 tons; six minelayers (*ex*-German, 1918), 330–512 tons, 15 knots, two 3·9-in., 40 mines; five minesweepers, 120 tons, 9 knots; one minesweeper, 78 tons, 17 knots; one seaplane depôt ship, Zmaj (built at Hamburg, 1929), 1870 tons, 15 knots; one training ship (1931), 720 tons, 8 knots; two submarine depôt ships (1895), and auxiliary craft.

One flotilla leader, Dubrovnik, built at Yarrow's, Scotstoun, completed 1932, length 371 feet, displacement 1880 tons, 42,000 S.H.P., speed 37 knots, carries four 5·5-in., 2 twin 2-pr., 2 triple 21-in. torpedo tubes, and 40 mines.

Three destroyers of 1200 tons building at Adria, turbines being built by Yarrow's.

Several guard vessels are building at Lürsoen, in Germany.

BRITISH AND FOREIGN FLOTILLAS.

Great Britain.

FLOTILLA LEADERS.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Length (Extreme).	Beam.	Draught.							
			ft. ins.	ft. ins.	ft. ins.		Tons.		Knots.			
Tribal Class :												
Ashanti	Denny	Bldg.	..	..	..	..	1850	..	..	8 4·7-in. guns	21″	..
Bedouin												
Eskimo	Vickers, Walker											
Mashona												
Matabele	Scotts											
Punjabi												
Sikh	Stephen											
Somali	Swan Hunter											
Tartar												
Afridi	Vickers-Armstrongs	Bldg.	..	..	..	..	1850	..	..	8 4·7-in. guns.	21″	..
Cossack												
Ghurka	Fairfields											
Maori												
Mohawk	Thornycroft											
Nubian												
Zulu	Stephen & Sons											
Inglefield	Cammell Laird	1937	..	34 0	..	2	1455	38,000	36	5 4·7-in. 2 ·5-in. M. ’5 smaller.	2 Q. 21″	175
Hardy		1936										
Grenville	Yarrow	1936	330	34 6	8 0	2	1460					175
Faulknor	Yarrow	1935	343	33 9	8 8	2	1475	38,000	36			125
Exmouth	Portsmouth Dockyard	1934										
Duncan	Portsmouth Dockyard	1933	329	33 0	8 8	2	1400	36,000	35½	4 4·7-in. 1 3-in. A.A. 2 2-pr., 1 M., 4 L.	2 Q.	..
Kempenfelt	J. S. White	1932	329	33 0	8 7	..	1390	36,000	35½			
Keith	Vickers	1931	323	32 3	8 6	2	1400	34,000	35	4 4·7 in., 2 2-prs. 1 M., 4 L.	2 Q.	..
Codrington	Swan Hunter	1930	343	33 9	10 0	2	1540	39,000	35	5 4·7-in., 2 2-prs., 1 M., 4 L.	2 Q. 21″	185
Wallace	Thornycroft	1919	329	31 11	12 4	2	1480	40,000	36	5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L.	2 T. 21″	182
Keppel	”	1925										
Broke, *ex*-Rooke	”	1925										
Bruce	Cammell Laird	1918	332 6	31 9	12 3	2	1530	40,000	36·5	5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L.	2 T 21″	182
Douglas’		1918										
Campbell		1918										
Mackay, *ex*-Claverhouse		1919										
Malcolm		1919										
Montrose	Hawthorn Leslie	1918										

DESTROYERS.

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Length. (Extreme.)	Beam.	Draught.							
			Feet.	ft. ins.	ft. ins.		Tons.		Knots.			
Kelly, Javelin, Intrepid, Hero, Greyhound, Fearless, Eclipse, Defender, Crusader, Beagle, & Acasta Classes :												
Kelly	H’wthorn Leslie	Bldg.	..	35 0	..	..	1690	40,000	36	6 4·7 in. guns	21″	..
Kashmir	John Brown											
Kandahar	Denny											
Kelvin	Fairfied											
Khartoum	Swan Hunter											
Kimberley	Thornycroft											
Kingston	White											
Kipling	Yarrow											
Jackal	John Brown	Bldg.	..	35 0	..	..	1690	40,000	36	6 4·7 in. guns	21″	175
Jaguar	Denny											
Jamaica	Fairfield											
Janus	Swan Hunter											
Javelin	Thorycroft											
Jersey	J. S. White											
Jervis	H’wthorn Leslie											
Jupiter	Yarrow											
Icarus	J. Brown	1937	323	33	..	..	1350	34,000	35½	4 4·7-in guns 7 smaller	10 21″	..
Ilex												
Isis	Yarrow											
Ivanhoe												
Imogen	Hawthorn Leslie											
Imperial												
Intrepid	J. S. White											
Impulsive												

Torpedo tubes : T. = triple Q. = quadruple.

Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Length (extreme).	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			
DESTROYERS—												
Javelin, etc., Classes —continued.												
Hero	Vickers (Parsons)	1936	323	33 0	8 6	2	1350	34,000	35½	4 4·7 in. 7 smaller	2 Q. 21″	..
Hereward ..												
Hostile ..	Scotts ..											
Hotspur ..												
Hasty ..	Denny ..											
Havock ..												
Hunter ..	Swan Hunter											
Hyperion ..												
Greyhound ..	Vickers-Armstrong	1936	323	33 3	8 6	2	1350	34,000	35½	4·7-in. 2 ·5-in. M. 5 smaller	2 Q. 21″	145
Griffin ..												
Garland ..	Fairfields											
Gipsy ..												
Gallant ..	Stephen & Sons											
Grenade ..												
Grafton ..	Thornycroft											
Glowworm ..												
Fearless ..	Cammell Laird	..	..	..	..	..	1375	36,000	35½	4 4·7-in. 2 ·5-in. M. 5 smaller.	2 Q. 21″	145
Foresight ..												
Foxhound ..	Brown	1935	329	33 3	8 6	2	1350					
Fortune ..												
Forester ..	J. S. White											
Fury												
Fame ..	Parsons/Vickers-Armstrong											
Firedrake ..												
Eclipse	Denny ..	1934	329	33 3	8 6	2	1375	36,000	35½	4 4·7-in. 2 ·5-in. M.G. 5 smaller.	2 Q. 21″	145
Echo												
Escapade ..	Scotts ..											
Escort ..												
Electra ..	Hawthorn Leslie											
Encounter ..												
Esk	Swan Hunter											
Express ..												
Defender ..	Vickers-Armstrong	1932—1933	317¾ (b.p.)	33	8 6	2	1375	36,000	35½	4 4·7-in. 1 3-in. A.A. 7 smaller	2 Q. 21″	145
Diamond ..												
Daring ..	Thornycroft											
Decoy ..												
Dainty ..	Fairfield ..											
Delight ..												
Diana ..	Palmers ..											
Duchess ..												
Crusader ..	Portsmouth Dockyard	1932	317¾ (b.p.)	33	8 6	2	1375	36,000	35½	4 4·7-in. 1 3-in. A.A. 2 2-pr., 1 M., 4 L.	2 Q. 21″	145
*Comet ..												
Basilisk	Brown ..	1931	323	32¼	8½	2	1360	34,000	35	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 Q. 21″	140
Beagle	,, ..											
Blanche	Hawthorn, Leslie											
Boadicea	,, ,,											
Boreas	Palmers ..											
Brazen	,, ..											
Brilliant	Swan, Hunter											
Bulldog	,, ,,											
Acasta	Brown ..	1930	323	32¼	8¼	2	1350	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q. 21″	140
Achates	Brown ..	1930										
Acheron	Thornycroft	1931										
Active	Hawthorn Leslie	1930										
Antelope	Hawthorn Leslie	1930										
Anthony	Scotts ..	1930										
Ardent	Scotts ..	1930										
Arrow	Vickers-Armstr.	1930										
Thornycroft Type:												
Amazon	Thornycroft ..	1927	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 T. 21″	140
Yarrow Type:												
Ambuscade	Yarrow	1927	322	31	8¼	2	1170	33,000	37		2 T. 21″	140

* For Crescent and Cygnet, renamed Frazer & St. Laurent, see under Royal Canadian Navy, p. 227.
Torpedo tubes: T. = triple. Q. = quadruple.

Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions.			Number of Screws.	Standards Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Length (Extreme)	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			
DESTROYERS—												
Admiralty "S" Class:												
Saladin	Stephen	1919	276	26¾	10⅝	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21″	103
Sardonyx	,,	1919										
Scimitar	Brown	1918										
Tenedos	Haw. Leslie	1919										
Thanet	,,	1919										
Thracian	,,	1922										
Stronghold	Scott	1919										
Sturdy	,,	1919										
Scout	Brown	1918										
Shikari	Doxford Chatham	1924										
Admiralty "V" Class:												
Vansittart	Beardmore	1919	312	29½	10⅝	2	1120	27,000	34	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130
Venomous	Brown	1919										
Verity	,,	1919										
Volunteer	Denny	1919										
Veteran	Brown	1919										
Wanderer	Fairfield	1919										
Wren	Yarrow	1923	312	29½	10⅝	2	1120	27,000	34			
Whitshed	Swan Hunter	1919										
Wild Swan	,, ,,	1919										
Witherington	J. S. White	1919										
Wivern	,, ,,	1919										
Wolverine	,, ,,	1920										
Worcester	,, ,,	1922										
Whitehall	Swan Hunter Chatham	1925										
Walpole	Doxford	1918	312	29½	10⅔	2	1100	27,000	34	4 4in., 1 2-pr., 1 M., 4 L.	2 T.	120
Whitley	,,	1918										
Wryneck	Palmer	1918										
Windsor	Scott	1918										
Wrestler	Swan Hunter	1918										
Wessex	Haw. Leslie	1918	312	29½	10·7	2	1100	27,000	34			
Winchester	J. S. White	1918										
Wolfhound	Fairfield	1918										
Westminster	Scott	1918	312	29½	10·7	2	1100	27,000	34	4 4-in., 1 2-pr., 1 M., 4 L.	2 T. 21″	120
Westcott	Denny	1918										
Wakeful	Brown	1917										
Walker	Denny	1918										
Walrus	Fairfield	1918										
Warwick	Haw. Leslie	1918										
Watchman	Brown	1918										
Whirlwind	Swan, Hunter	1918										
Winchelsea	J. S. White	1918										
Vanessa	Beardmore	1918	312	29½	10⅝	2	1090	27,000	34			
Vanity	,,	1918										
Vidette	Stephen	1918										
Vivien	Yarrow	1918										
Valentine	C. Laird	1917								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120
Valorous	Denny	1917										
Vimy (late Vancouver)	Beardmore	1918								4 4-in., 1 2-pr., 1 M., 4 L.	1 T. 1 D.	
Vanoc	Brown	1917								4 4-in., 1 2-pr., 1 M., 4 L.	3	
Vanquisher	,,	1917								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	
Vega	Doxford	1917										
Velox	,,	1918									1 T., 1 D.	
Venetia	Fairfield	1917									2 T.	
Verdun	Haw. Leslie	1917										
Versatile	,,	1918	..	..	..	..	..	..	..		1 T., 1 D.	120
Vesper	Stephen	1918								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	
Vimiera	Swan Hunter	1917										
Vivacious	Yarrow	1917									1 T. 1 D.	
Vortigern	J. S. White	1918										
Thornycroft "V" Class:												
Witch	Thornycroft Devonport	1924	312	30¾	10·9	2	1140	30,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130
Wishart	Thornycroft	1920										
Woolston	,,	1918	312	30¾	10¼	2	1120	30,000	35	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120
Wolsey	,,											
Viceroy	,,											
Viscount	,,											
Admiralty "R" Class:												
Skate	Brown	1917	276–276¼	26¾	10⅔	2	900	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21″	98

Torpedo tubes: D = double. T. = triple.

Great Britain—*continued.*

SUBMARINES.

Name or Number.	Where Built.	Completed.	Dimensions.			No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).
			Length. (Extreme)	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			
Unity Class:												
Undine ..	Vickers ..	Bldg.	..	..	..	..	..	..	..	..	..	..
Unity												
Ursula ..												
Triton Class:												
Triton	Vickers-Armstrong	Bldg.	..	..	..	..	..	..	..	..	..	..
Thetis	Cammell Laird	Bldg.	..	..	..	..	1,100	..	..	..	..	..
Triumph ..												
Trident ..												
Tribune ..												
Thistle ..	Vickers ..											
Taku ..	Cammell Laird											
Tarpon ..	Scott's	Bldg.	..	..	..	..	..	..	..	..	..	..
Triad ..	Vickers	Bldg.	..	..	..	..	1,100	..	..	..	..	..
Truant ..	Vickers	Bldg.	..	..	..	..	..	..	..	..	..	..
Tuna ..	Scott's											
Tigris ..	Chatham	Bldg.	..	..	..	..	...	..	..	..	..	..
Thames Class:												
Thames ..	Vickers-Armstrong	1932	345	28	13·5	..	1,805/2,680	10,000/2,500	21¾/10	1 4-in., 2 smaller	6	60
Severn ..	Vickers-Armstrong	1935	345	28	13·7	..	1,850/2,710	10,000/2,500	22½/10		..	60
Clyde												
Porpoise Class:*												
Porpoise ..	Vickers-Armstrong	1933	289	29·8	13·8	..	1,500/2,060	3,300/1,630	15/8¾	1 4-in., 2 smaller	6	..
Grampus ..	Chatham ..	Bldg.	271½	25½	15	..	1,520/2,140	..	..	..	..	55
Narwhal ..	Vickers ..	1935										
Rorqual ..												
Cachalot ..	Scott's ..	Bldg.										
Seal	Chatham ..											
Swordfish Class:												
Starfish ..	Chatham ..	1933	202·5	24	10·5	..	640/935	1,550/1,300	13¾/10	1 3-in., 1 smaller	6	40
Seahorse ..												
Swordfish ..												
Sturgeon ..												
Sealion ..	Cammell Laird	1934	208·7	24	10·5	..	670/960	1,550/1,300	13¾/10		6	40
Salmon ..		1935										
Shark	Chatham ..	1934										
Snapper .		1935										
Seawolf ..	Scott's ..	1936										
Sunfish ..	Chatham ..	1937										
Spearfish ..	Cammell Laird	1936	..	..	..	..	..	..	..	..	..	40
Sterlet	Chatham ..	Bldg.										
Rainbow Class:												
Rainbow ..	Chatham ..	1932	290	29·8	13·8	..	1,475/2,015	4,400/1,320	17½/9	1 4-in.	8	53
Regent ..	Vickers-Armstrong	1930										
Regulus ..		1930										
Rover .		1931										
Parthian Class:												
Parthian ..	Chatham ..	1931	290	29·8	13·7	..	1,475/2,040					
Perseus ..	Vickers-Armstrong ..	1930										
Proteus ..												
Pandora ..												
Phœnix ..	Cammell Laird	1931										
Odin Class:												
Odin	Chatham ..	1929	283½	29·8	13·7	..	1,475/2,030	4,400/1,320	17½/9	1 4-in., 2 Lewis	8	53
Olympus ..	Beardmore ..	1930										
Orpheus ..	Beardmore ..	1930										
Osiris	Vickers ..	1929										
Oswald ..	Vickers ..											
Otus	Vickers ..											
Oberon Class:												
Oberon ..	Chatham ..	1927	270	28	13·2	..	1,311/1,830	2,950/1,350	15/9	1 4-in., 2 Lewis	8	53
Oxley ..	Vickers ..	1927	275	27·7	13·3	..	1,350/1,870	3,000/1,350	15½/9	1 4-in., 2 Lewis	8	53
Otway ..												
X Type:												
X1	Chatham ..	1925	363½	29·8	15·3	..	2,425/3,600	7,000/2,600	19½/9	4 5·2 in., 2 Lewis	6	100
L 50 Class:												
L71	Scott's ..	1920	235	23·5	12	2	845/1,150	2,400/1,600	17½/10½	1 4-in., 1 Lewis	6	44
L69 .. .	Beardmore ..	1923										
L56 .. .	Fairfield ..	1919								1 4-in., 1 Lewis		
L54	Denny ..	1924										
L53	Armstrong ..	1925								2 4-in., 1 Lewis		

* Minelaying submarines.

Great Britain—*continued.*

SUBMARINES—*continued.*

Name or Number.	Where Built.	Completed	Dimensions.			No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).
			Length. (Extreme)	Beam.	Draught.							
			Feet.	Feet.	Feet.		Tons.		Knots.			
L Class:												
L27	Vickers ..	1926	238½	23½	11·7	..	760/1,080	2,400/1,600	17½/10½	1 4-in., 1 Lewis (L25 carries 14 mines in addition)	4	41
L26	Vickers ..	1926										
L23	Vickers ..	1924										
L21	Vickers ..	1920										
H Class:												
H50	Beardmore ..	1920	171	15·75	12·5	2	410/500	480/320	13/10½	1 Lewis	4	23
H49	Beardmore ..	1919										
H44	Armstrong ..	1920										
H43	Armstrong ..	1919										
H34	Cammell Laird	1919										
H33	Cammell Laird	1919										
H32	Vickers ..	1919										
H31	Vickers ..	1919										
H28	Vickers ..	1918										

SLOOPS

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
SLOOPS.		ft. ins.	ft. ins.	ft. ins.								
Convoy Escorts:												
Egret .	1190	282		8 6	3,300	J. S. White	J. S. White		Bldg.			
Auckland						Denny	Denny					
Pelican.						Thornycroft	Thornycroft					
Convoy Sloops:												
‡Enchantress	1190	282	37 0	8 6	3,300	J. Brown	J. Brown	1934	1935	4 4·7-*in.* guns.	18	..
*Stork . .								1936	1936	4-3 pr.		
Bittern .	1180	282	37 0	8 6	3,300	Denny	Denny	..	Bldg.	1 small gun	18	..
						J. S. White				4 4·7-*in.*		
Coastal Sloops:												
Kingfisher	535	234 b.p.	26 6	6 6	3,600	Fairfield	Fairfield	1935	1935	1 4-*in.* gun. 8 smaller	20	..
Mallard												
Puffin .	..	..	..	..	..	Stephen	..	..	1936		..	60
Sheldrake												
Kittiwake	..	..	..	..	..	Thornycroft	..	..	1937		..	..
Widgeon	585	..	..	..	..	Yarrow	..	..	Bldg.		..	..
Grimsby Class:												
Grimsby .	990	266	36 0	7 6	2,000	Devonport	J. S. White	1933	1934	2 4·7-*in.* guns. 1 3-*in.* 12 smaller	16½	100
Leith .						Devonport						
Lowestoft .						Devonport						
Wellington						Devonport		1935	1935			
Londond'ry								1934	1935			
Deptford .						Chatham						
Aberdeen .	1060	..	..	..	..	Devonport	Thornycroft	1935	Bldg.	3 4-*in.* 12 smaller		
Fleetwood .						Devonport				4 4-*in.* 12 smaller		
SLOOP MINE-SWEEPERS.												
Halycon Class:												
Halcyon .		..	..	..	..	J. Brown	J. Brown	1934	1934	1 4-*in.*, 1 4-*in.* A.A. 1 2-*pr.*	16½ est.	..
Skipjack .	815†	246	33 6	7 3	1,770							
Harrier .						Thornycroft	Thornycroft					
Hussar .	..	..	..	..	..							
Speedwell						Hamilton	Beardmore	1935	1935			
Niger . .	815	246	33 6	7 7	2,000	J. S. White	J. S. White	1935	1936	2 4-*in.* 9 smaller	..	80
Salamander												
Hebe . .	..	..	..	..	..	Devonport	..	1936	Bldg.	2 4-*in.*	..	..
Sharp-shooter												
Hazard .	..	..	..	..	..	Wm. Gray	..	1937	Bldg.	..	..	..
*Gleaner .												

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* Will be employed as surveying vessels and will carry 1 small gun only.
‡ In addition to her normal duties Enchantress will be made available for occasional use by the Board of Admiralty.

Great Britain—*continued.*

SLOOPS—*continued.*

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where Built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
		ft. ins.	ft. ins.	ft. ins.								
Halcyon Class—cont.												
Gossamer .	..	..	..	..	..	Hamilton's	Stephen					
Leda . .	..	..	..	..	..	Devonport	Richardsons, Westgarth	1937				
Seagull .	..	..	..	..	..							
*Franklin .						Ailsa	Thornycroft					
*Jason . .	..	..	..	..	..							
*Scott . .	..	..	..	..	..	Caledon	Parsons					
Bramble .	..	..	..	..	..	Devonport	Barclay,Curle					
Brizmart .	..	..	..	..	..	Devonport	Barclay Curle					
Speedy . .	..	..	..	..	..	J. Hamilton	J. S. White					
Sphinx . .	..	..	..	..	..	J. Hamilton	J. S. White					
Shoreham Class:												
Repeat Shoreham Class:												
Falmouth.	1060	281 4	35 0	8 3	2,000 P.T. (G.)	Devonport	Hawthorn Leslie	1932	1932	1 4-*in.*, 1 4-*in.* A.A. 4 3-*pr.* 8 L.	16–16½	..
Milford .							Yarrow					
Weston .							Yarrow		1933			
Dundee .						Chatham	Hawthorn Leslie					
Bideford .	1105*	281 4	35 0	8 0	2,000 P.T. (G.)	Devonport	J. S. White & Devonport	1931	1931	1 4-*in.*, 1 4-*in.* A.A. 4 3-*pr.* 8 L.	16–16½	..
Rochester.						Chatham	J. S. White & Chatham	1932	1932			
Fowey .						Devonport	J. S. White & Devonport	1930	1931			
Shoreham.						Chatham	J. S. White & Chatham	1930	1931			
Hastings Class:												
Hastings .	1025	266 4	34 1	9 1	2,000 P.T. (G.)	Devonport	Devonport	1930	1931	1 4-*in.*, 1 4-*in.* A.A. 2 3-*pr.* 8 L.	16–16½	..
Penzance ,						Devonport	Devonport	1930	1931			
Folkestone	1045					Swan, Hunter	Hawthorn, Leslie	1930	1930			
Scarborough						Swan, Hunter	Hawthorn, Leslie	1930	1930			
Bridgewater Class:												
Bridgewater	1045	266 4	34 0	8 6	2,000 P.T. (G.)	Hawthorn Leslie	Hawthorn Leslie	1928	1929	1 4-*in.*, 1 4-*in.* A.A., 4 L.	16–16½	95
Sandwich												
Anchusa Class:												
Chrysanthemum	1345	276 0	35 0	13 3	2,500 recip.	Armstrong	Wallsend Slipway	1917	1918	2 3-*pr.*	16·5	100
Arabis Class:												
Lupin† .	1175	267 9	33 6	12 0	2,000 recip.	Simons	Simons	1916	1916	2 4-*in.*, 4 3-*pr.*, 1 2-*pr.*, 8 L.	16–17	100
Rosemary						Richardson Duck	Blair	1915	1916	1 4-*in.*, 2 2-*pr.* 2 M., 8 L.		
Acacia Class:												
Foxglove .	1165	262 6	33 0	12 6	1,800 recip.	Dunlop Bremner	Dunlop Bremner	1915	1915	2 4-*in.*, 4 3-*pr.* 2 2-*pr.*, 8 L.	16–17	100

* Will be employed as surveying vessels and will carry 1 small gun only.
† Converted to oil-burning,

Great Britain—*continued.*

TWIN-SCREW MINESWEEPERS, RIVER GUNBOATS.

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
TWIN-SCREW MINE-SWEEPERS.												
Aberdare	710	231 0	28 7	9 0	2,200 recip.	Ailsa	Ailsa	1918	1918	1 *4-in.*, 1 *12-pr.* A.A. Alresford, Caterham, Ross and Saltburn no armament.	16	73
Abingdon						Ailsa	G. Clark					
Albury						Ailsa	Ailsa	1918	1919			
Alresford						Ailsa	W. H. Allen	1919	1919			
Bagshot						Ardrossan Dry Dock Co.	W. H. Allen	1918	1919			
Derby						Clyde S.B. Co.	Clyde S.B. Co.	1918	1918			
Dundalk						Do.	Do.					
Dunoon						Do.	Do.					
Fermoy						Dundee S.B. Co.	Cooper & Greig	1919	1919			
Fareham						Dunlop, Bremner	Dunlop, Bremner	1918	1918			
Tiverton						Simons	Simons	1918	1918			
Elgin						Do	Do.					
Sutton						McMillan	Yarrow	1918	1919			
Saltash						Murdock & Murray	Do.					
Saltburn						Do.	Do.					
Selkirk						Do.	D. Rowan	1918	1919			
Ross						Lobnitz	Lobnitz	1919	1919			
Widnes						Napier & Miller	Rowan	1918	1918			
Harrow						Eltringham	Wallsend Slipway					
Huntley						Do.	Eltringham	1919	1919			
Lydd						Fairfield	Fairfield	1918	1919			
Stoke						C. Rennoldson	Shields Eng. Co.	1918	1918			
Pangbourne						Lobnitz	Lobnitz					
Tedworth	675	231 0	28 0	.. 9 0	1,800 recip.	Simons	Simons	1917	1917	1 *3-in.* A.A.	14	35
RIVER GUN-BOATS.												
Scorpion	..	..	..	..	..	J. S. White	..	Bldg.	..	*4-in.* guns	..	..
Robin	226	150 b.p.	26 8	3 0	800 recip.	Yarrow	Yarrow	1934	1934	1 *3·7-in.* Howitzer, 1 *6-pr.*, 8 L.	12¾	35
Dragonfly						Thornycroft	Thornycroft					
Grasshopper												
Sandpiper	185	160 0 b.p.	30 8	1 10	600 recip.	Thornycroft	Thornycroft	1933	1933	1 *3·7-in.* Howitzer, 1 *6-pr.*, 8 L.	11½	35
Falcon	372	150 0	28 8	4 9	2,250 (G.)	Yarrow	Yarrow	1931	1931	1 *3·7-in.* Howitzer, 2 *6-pr.*, 8 L.	15	55
Gannet	310	185 0	29 0	4 0	2,250 (G.)	Yarrow	Yarrow	1927	1928	2 *3-in.* A.A., 8 L.	16	60
Petrel								1927	1927			
Seamew	262	168 0	27 0	4 0	1,370 (G.)	Do.	Do.	1928	1928		14	60
Tern								1927	1927			
Aphis	625	237 6	36 0	4 6	2,000 recip.	Ailsa	Ailsa	1915	1915	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.	14	55
Bee						Do.	Do.	1915	1916	1 *3-in.* A.A., 2 *3-pr.*, 1 *2-pr.*, 8 L.		
Cicala						Barclay Curle	Barclay Curle	1915	1916	2 6-in., 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Cockchafer						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 8 L.		
Cricket						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Gnat						Lobnitz	Lobnitz	1915	1915			
Ladybird						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* AA., 1 *2-pr.*, 8 L.		
Mantis						Sunderland S.B. Co.	N.E. Marine	1915	1915	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Moth						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Scarab						Wood, Skinner	Do.	1915	1915			
Tarantula						Do.	Do.	1915	1916	1 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.* 8 L.		

Argentine Republic.

Name or Number.	Where Built.	Launched	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Flotilla Leaders—													
Cervantes (*ex*-Spanish Churruca) Juan de Garay (*ex*-Spanish Alcala Galiano)	Cartagena ..	1925	331½	31½	10½	2	1650	42,000	36	5 4·7 in., 1 3-in. A.A., 4 M	2 triple 21-in.	—	—/540
Mendoza .. La Rioja .. Tucuman ..	J. S. White, Cowes	1928 1929 1929	318¼	31·8	12¼	2	1520	45,000	36 (La Rioja 39·4 *t.*)	5 4·7 in., 1 3-in. A.A., 2 2-pr., 4 M.	2 triple 21-in.	160	—/700
Destroyers—													
Catamarca* .. .. Jujuy†	Schichau .. Germania ..	1911	288·7	27¼	10	2	972	18,000	32	3 4-in. 2 1-pr.	4 21-in.	100	—
Cordoba* .. .. La Plata†	Shichau .. Germania ..	1910 1911	295¼	29·5	10	..	1000	28,000	34·7 *t.*			100	—
San Juan .. San Luis ..	J. Brown ..	1937	323	33	8½	..	1350	34,000	35½	4 4·7 in., 8 smaller	2Q 21-in.	150	/450
Misiones .. Santa Cruz ..	Cammell Laird	1937	323	33	8½	..	1350	34,000	35½	4 4·7 in., 8 smaller	2Q 21-in.	150	/450
Buenos Aires Entre Rios .. Corrientes ..	Vickers, Barrow	1937	323	33	8½	..	1350	34,000	35½	4 4·7 in., 8 smaller	2Q 21-in.	150	/450
Submarines—													
Santa Fe .. .. Salta .. .. .. Santiago del Estero	Taranto ..	1931 1932 1933	226¾	21¼	13	2	850/1080	3,000/1,300	17·5/9	1 4·7-in. 1 2-pr. A.A.	8 21-in.	41	—

* Converted to oil-burning, 1927, at Buenos Aires. † Converted to oil-burning at Buenos Aires.

Torpedo tubes: Q = quadruple.

Brazil.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Piahuy .. .. .. Matto Grosso .. .. Parahyba.. .. .. Rio Grande del Norte Alagoas .. .. .. Santa Catharina .. Parana .. .. .. Sergipe	Yarrow ..	1908 1908 1909 1909 1909 1909 1910 1909	240 p.p.	23·6	7·5	2	560	8,000	27 (27·1–28.7 on trials)	2 4-in., 4 3 prs.	2 18-in.	75	140/—
Maranhao (*ex*- Porpoise)	Thornycroft..	1913	265·3	26·5	10	..	934	22,500	31	3 4-in., 1 2-pr.	2 dble. 21-in.	..	—/250
Greenhalgh .. .. Marcillo Dias.. .. Mariz e Barros ..	Ilha das Cobras Rio de Janeiro	Bldg.	..	..	..	..	1500	..	36	5 5 in.	..	..	..
Submarines—													
Humayta	Spezia (Ansaldo Fiat)	1927	282	25·6	14	2	1450/1884	4,800/2,200	18·5/10	1 4-in. A.A.; carries mines	6 21-in.	55	—/140
Tamoya .. .. .. Tymbira .. .. Tupy	Spezia (Fiat)	1913	150	13·8	12	..	250/370	700/500	13·5/8	—	2 18-in.	..	..

9 destroyers of 1,600 tons, 6 submarines of 1,003 tons, and 6 submarines of 800 tons are approved to be built in eight years.
6 submarines are building in Italy.

Chile.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Serrano	Thornycroft's	1928	300	29	9	2	1090	28,000	35	3 4·7-in., 1 3-in.	2 triple 21-in.	130	— / 340
Orella													
Riquelme													
Hyatt													
Videla													
Aldea													
Almirante Lynch,	White..	1912	320 p.p.	32·6	11·1	3	1850	30,000	31	6 4-in. 4 M.	4 18-in.	190	427 / 80
Almirante Condell		1913											
To be Scrapped Almirante Riveros (*ex*-Faulknor)	White	1914	320 p.p.	32·6	11	3	1700 to 1740	30,000	31 31·5	2 4·7-in., 2 4-in., or 2 2-pdr. A.A.	4 21-in.	174	403 / 83
Almirante Uribe (*ex*-Broke)													
Almirante Williams (*ex*-Botha)													
Submarines—													
Capitan Thompson	Vickers Armstrong's	1929	275	27·5	14·8	2	1520 / 1990	2750 / 1300	15 / 9	1 4-in.	8 21-in.	..	— / 200
Almirante Simpson		1929											
Capitan O'Brien		1928											
H 1. Gualcola	Fore River, U.S.A.	1915	150·3	15·75	12·3	2	355 / 470	480 / 640	13 / 11	..	4 18-in.	22	— / 17·5
H 2. Tequalda													
H 3. Rucumilla													
H 4. Cuale													
H 5. Quidora													
H 6. Frezia													

3 submarines are projected (no money voted)

Denmark.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme).	Beam.	Draught.								Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Torpedo Boats.													
First Class—													
T4. Glentin	Royal Dockyard, Copenhagen	1934	198·9	19·5	7·8	..	285	6,000	28	2 3·4-in.	6 17·7 in.	60	— / 40
T5. Hogen													
T6. Ornen													
T3. Laxen		1930	198·9	19·5	7·4	2	281	6,000	28	2 3-in.	8 17·7 in.	46	— / 26
T1. Dragen		1929											
T2. Hvalen		1930											
R4. Havkatten †		1919	126·3	13·9	9	2	96	2,000	24·6 *t*.	2 6-pr. A.A.	2 (1 in R2-4)	22	15 / —
R5. Sælen †		1919											
R3. Nordkaperen †		1918											
R2. Makrelen †		1918											
S6. Narhvalen *		1917											
S5. Havhesten *		1917											
S4. Söhunden *		1917											
S3. Sölöven *		1916											
S2. Stören *		1916											
S1. Springeren *													
P1. Hvalrossen †		1913	148·2	16·9	7·5	2	158	3,480	26·2 *t*.	1 3-in.	4 18″	30	28 / —
To be Scrapped O3. Söülven	Burmeister, Copenhagen	1911	181·7	18	6·5	2	222	5,000	27·5	2 3-in	5 18″	33	80 / —
O2. Flyvefisken		1911											
O1. Söridderen	Yarrow & Co.	1911											
Submarines—													
Daphne. D1	Royal Dockyard, Copenhagen	1926	161	16	8·2	..	305 / 370	900 / 400	13·4 / 7	1 3-in. A.A.	6 18″	18	— / 16
Dryaden. D2													
Flora. C3	„	1919	155·7	14·4	3·8	..	301 / 369	900 / 640	14·5 / 10·5	1 6-pr.	4 18″	24	— / 13
Bellona. C2													
Rota. C1 ‡	„	..											
Galathea. B12	„	..	133·3	12·3	8	..	181 / 231	450 / 340	13·5 / 9·8	1 6-pr.	3 18″	12	— / 9
Triton. B10	„	1914											
Ran. B9	„	1915											
Havkalem. E3	„	1937	..	..	..	..	300	..	15 / 8	2 1·5 in.	5 18″	..	..
Havfruen. E2	„	1937	..	..	..	..	300	..	15 / 8	2 1·5 in.	5 18″	..	..
Havmanden. E.	„	1936	..	..	..	..	300	..	15 / 8	2 1·5 in.	5 18″	..	..

* Used as minesweepers. † Used as patrol vessels. ‡ Rota has one deck tube in addition.

France.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal / Oil
Flotilla Leaders—			et.	Feet.	Feet.		Tons.		Knots.				Tons.
Volta	Ch. de Bretagne, Nantes	1936 1937	452	41·1	15	..	2,884	90,000	38	8 5·4-in., 4 1·5-in. A.A.	9 21·7	240	..
Mogador	Lorient.. ..	Bldg.										..	..
Le Fantasque	Lorient.. ..	1934	434½	39⅓	14	2	2,569	74,000 Terrible did 45 knots on trial.	37	5 5·5-in., 4 1·5-in. A.A.	9 21·7 in.	220	— / 650
L'Audacieux													
Le Malin	Ch. de la Mediterranée	1934											
L'Indomptable													
Le Triomphant	Ch. de France												
Le Terrible													
Vauquelin	Ch. de France, Dunkirk	1932	424½	39	14	2	2,441	74,000	36	5 5·5-in., 4 1-pr. A.A.	7 21·7 in.	220	— / 500
Kersaint	Ch. de la Loire, Nantes	1931											
Cassard	Ch. de Bretagne, Nantes	1932											
Tartu	Ch. de la Loire, Nantes	1931											
Maillié Brézé	Ch. de Penhoet, St. Nazaire	1931											
Le Chevalier-Paul	Ch. de la Mediterranée, Havre	1932											
Aigle	Ch. de France, Dunkirk	1930	426	38	14	2	2,441	74,000	36	5 5·5-in., 4 1-pr. A.A.	6 21·7 in.	220	— / 500
Vautour	Ch. de la Mediterranée, Havre												
Albatros	Ch. de la Loire, St. Nazaire												
Gerfaut	Ch. de Bretagne, Nantes												
Milan	Lorient	1930	426	38	14	2	2,441	75,000	37	5 5·5-in., 4 1-pr. A.A.	7 21·7 in.	220	— / 500
Epervier													
Valmy	Ch. de Penhoet, St. Nazaire	1928	427	37½	15	2	2,436	70,000	36	5 5·5-in., 4 1-pr. A.A.	6 21·7 in.	216	— / 650
Verdun	Ch. de la Loire, St. Nazaire	1928											
Vauban	Ch. de France Dunkirk	1930											
Lion	Dunkirk ..	1929	416	36	14·8	2	2,126	50,000	35·5	5 5·1-in., 2 3-in. A.A.	6 21·7 in.	206	— / 530
Bison	Lorient ..	1928											
Guépard	Lorient ..	1928											
Chacal	St. Nazaire..	1924											
Jaguar	Lorient Dy.	1923											
Leopard	St. Nazaire..	1924											
Lynx	,,	1925											
Panthère	Lorient Dy.	1924											
Tigre	Nantes ..	1924											
Amiral Sénès, *ex*-German S. 113	Germany ..	1917	346·5	33·5	14·8	2	1,526	44,000	34	4 5·9-in., 2 1-pr.	2 D.	180	— / 700
Destroyers—													
Le Hardi	Loire	Bldg	..	..	..	..	1 772	..	37	4 5·1-in.	6 21 in.	..	..
Mameluck..													
Epee	Gironde ..												
Lansquenet													
Casque	Laseyne ..												
Fleuret													
Forbin	Ch. de Graville Le Havre	1928	351·7	32·2	10·2	..	1,378	35,000	34	4 5·1-in., 2 1-pr. A.A.	6 21·7 in.	146	— / 300
Frondeur	Ch. Navals Français, Caen	1929											
Fougueux	Ch. de Bretagne, Nantes	1928											
Foudroyant	Ch. de Dyle et Bacalon, Bordeaux	1929											
Basque	Maritime ..	1929											
Bordelais	Bordeaux ..	1928											
Boulonnais	Caen	1927											
Brestois	Nantes ..	1927											
L'Adroit	Dunkirk ..	1927											
L'Alcyon	Bordeaux ..	1926											
Le Fortune	Caen												
Le Mars	Caen												
La Palme	Nantes ..												
La Railleuse	Nantes ..												

The new programme includes 3 destroyers.

France—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
DESTROYERS—*Contd.*													
Bourrasque	**Dunkerque**	**1925**											
Cyclone	Havre	1925	346½	33·0	13·9	2	1,319	33,000	33	4 5·1-in., 1 3-in. A.A.	6 21·7-in.	140	— 350
Mistral													
Orage	Caen	1924											
Ouragon													
Simoun	St. Nazaire	1924											
Sirocco	Rouen												
Tempête	Nantes	1925											
Tramontane	Bordeaux	1924											
Trombe	Harfleur												
Typhon	Bordeaux	1925											
Tornade	Barcelona	1925											
Ens. Roux	Rochefort	1915	290·8	28·3	10·9	2	787	18,000	30	2 3·9-in., 1 3-in., 4 9 pr.	4 18-in.	98	— 206
Ens. Gabolde	Havre	1921	271	28·3	11·9	2	802	22,000	33	3 3·9-in., 1 3-in. A.A.	4 21·7-in.	98	— 200
Intrépide,*	Nantes	1911	290·5	28·9	11·5	..	915	24,800	27	4 3·9-in. 1 3-pr. A.A.	4 18-in.	102	280 74
Aventurier*													
TORPEDO BOATS—													
La Melpomène	Nantes	1935	264·9	26·0	9·2	..	610	22,000	34·5	2 3·9-in., 4 M.G.	4 15·7-in.	..	..
La Pomone													
La Flore													
L'Iphigenie													
Bombarde	Nantes	1936	..	..	..	..	..	..	..	..	..	..	..

1st class torpedo boats (1905–7), Nos. 349, 369, 85 tons, 2000 H.P., 26 knots, 1 3-in. gun, 1–3 torpedo tubes.
* Converted to oil-burning.

Name or Number.	Where Built.	Launched.	Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
							Surf. Sub.	Surf. Sub.	Surf. Sub.				
CRUISER SUBMARINES—													
Surcouf	Cherbourg	1929	393·7	29·5	23	2	2880 4300	7600 3400	19 11	2 8-in. 2 1-pr.	14 21-in.	150	..
SUBMARINES—													
Roland Morillot	Cherbourg	Bldg.	..	..	..	..	1100 ..	..	..	..	..	..	..
La Praya	Cherbourg	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Agosta	Cherbourg	1934	302	26·8	15·5	..	1379 2060	8000 ..	20 10	1 3·9-in., 1 smaller	11	63	..
Beveziers		1935											
Ouessant	Brest	1936											
Sidi-Ferruchi		1937											
Sfax	Ch. de la Loire	1934											
Casabianca		1935											
Le Glorieux	Cherbourg	1932	302·8	26·8	15·5	2	1379 2060	8000 2000	21 10	1 3·9-in., 1 1·5-in. A.A.	11	61	..
Le Centaure	Cherbourg	1933											
Le Héros	Brest	1933											
Le Conquerant	Brest	1932											
Le Tonnant	Loire	1934											
L'Espoire	Cherbourg	1931											
Persée	Ch. Navals Français, Caen	1930	301·8	26·8	15·5	2	1379 2060	6000 2000	18 10	1 3·9-in., 1 1·5-in. A.A.	11	61	.
Protée	Forge et Ch. de la Mediterranée la Seyne												
Pégase	Ch. de la Loire, St. Nazaire												
Phénix	Ch. Dubigeon, Nantes												
Achille	Brest	1933	301·8	26·8	15·5	2	1379 2060	6000 2000	18 10	1 3·9-in., 1 1·5-in. A.A.	11	61	— 96
Ajax													
Acheron	Ch. de la Loire, St. Nazaire	1929–1930											
Argo	Ch. Dubigeon, Nantes												
Acteon													
Pascal	Brest	1928–1929	302·5	26·8	15·5	2	1379 2060	6000 2000	18 10	1 3·9-in., 1 1·5-in. A.A.	11	61	— 96
Pasteur													
Poncelet	Lorient												
Henri Poincare													
Archimede	Caen												
Fresnel	Ch. de Penhoet, St. Nazaire												
Monge	Ch. de la Mediterranée, la Seyne												

The new French 3-year programme includes 12 submarines.

France—*continued.*

Number and Name	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Speed. Surf./Sub.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
CRUISER SUBMARINES—*Contd.*													
*Perle	Toulon	1933	216·5	23·3	13·5	2	669/910	1300/800-1000	12/9	1 3-in., 32 mines	5 21·7	40	..
*Diamant		1933											
*Rubis		1930											
*Nautilus		1928											
*Saphir		1929											
*Turquoise		1929											
Redoubtable	Cherbourg	1928	302·5	30·5	15·5	2	1384/2080	6000/2000	18/10	1 3·9-in. A.A. 1 1-pr. A.A.	11	..	—/96
Vengeur													
Requin	Cherbourg	1924	278·8	22·5	15	2	974/1415	2900/1800	16/10	1 3·9-in. A.A.	10	54	..
Morse		1925											
Narval		1925											
Souffleur		1924											
Caiman		1927											
Dauphin	Toulon	1925											
Espadon		1926											
Marsouin	Brest	1924											
Phoque		1926											
SUBMARINES—													
Aurore	Loire	1936	238·6	..	..	..	805	..	..	1 3·9-in.	..	..	..
La Creole	Havre	Bldg.											
La Bayadere													
La Favorite	Le Trait												
L'Africaine													
Emeraude	Toulon	Bldg.											
Minerve	Cherbourg	1934	224	15·8	13	..	597/800	1800/1230	14½/9	1 3-in.	8 21·7	43	..
Junon	Havre	1935											
Venus	Worms	1935											
Iris	Dubigeon	1934											
Orphée	Ch. Normand, Havre	1932	211	15·8	..	..	558–570/787	1300/1000	14/9	13-in., A.A.	8 21″	43	..
Oréade		1932											
Orion		1931											
Ondine		1931											
Psyche	Ch. Normand	1932											
Sybille	Worms												
Vestale	Schneider												
Sultane													
Amphitrite	Le Trait	1932	216¼	16·2	12·7	2	565–571/787	1300/1000	14/9·2	1 3-in. A.A.	8 21″	..	..
Antiope	Havre	1932											
Atalante	Chalons-sur-Saone	1930											
Amazone	Le Trait	1932											
Diane	Chantiers Normand, Havre	1930											
Meduse		1930											
Argonaute	Schneider et Cie Chalons-sur-Saone	1929											
Arethuse		1929											
Ariane	Havre	1925	216·5	16	12·8	2	576/766	1200/1000	14/9	1 3-in. A.A.	7 21·7″	40	..
Danaé		1927											
Eurydice		1927											
Circé	Chalons	1925	204·5	17·5	12·8	2	552/765	1250/1000	14/9	1 3-in. A.A.	7 21·7″	40	..
Calypso		1926											
Doris		1927											
Thetis		1927											
Naïde	St. Nazaire	1925	210	17	12·8	2	548/744	1300/1000	14/9·5	1 3-in. A.A.	7	39	..
Sirène		1925											
Nymphe		1926											
Galatée		1925											
Gustave Zédé	Cherbourg	1913	243	19·7	12·3	..	771–1080	2400/1500	16/10	1 3-in. ..	8 18″	47	—/68
Jean Corre (*ex*-U.B. 155)	Bordeaux	1917 1918	182·5	19	12	..	464–640	1100/760	12/7·5	1 4·1-in., 1 M.	5 19·7″	34	—/74
*René Andry (*ex*-U. 119)	,,	1917	267·5	24	14	..	1041–1525	2400/1200	14·5/7·2	1 5·9-in., 1 M. 42 mines	4 19·7″	54	—/132

French submarines are divided into two classes. 1st class: All vessels of 850 tons and above in the surface condition, including the U minelayers. 2nd class; All smaller vessels.

* Mine-laying submarines.

Germany.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
(Z 1) Leberech Maass (Z 2) Georg Thiele (Z 3) Max Shultz .. (Z 4) Richard Beitzer	Deutsche-Werke, Kiel	1935	374	37	9½	..	1625	40,000	36	5 5-in.	8 21 in.	252	..
(Z 5) Paul Jacobi .. (Z 6) Theodor Riedel (Z 7) Hermann Shoemann (Z 8) Bruno Heinemann (Z 9) Wolfgang Zerker	Germania-Werft, Kiel	1935	374	37	9½	..	1625	40,000	36	5 5-in.	8 21 in.	252	..
(Z 10) Hans Lody .. (Z 11) Bernd von Arnim (Z 12) Erich Giege (Z 13) Erich Koellner	Deschimag, Bremen	1935	374	37	9½	..	1625	40,000	36	5 5.in.	8 21 in.	252	..
(Z 14) Friedrich Ihn (Z 15) Erich Steinbriuck (Z 16) Friedrich Eckoldt	Blohm & Voss Hamburg	1935	374	37	9½	..	1625	40,000	36	5 5-in.	8 21 in.	252	..
Z 17 Z 18 Z 19 Z 20 Z 21 Z 22	Deschimag, Bremen	Bldg.	..	..	..	..	1811	..	..	..	..	..	..
Iltis .. .. Wolf .. .. Tiger .. .. Luchs .. .. Jaguar .. .. Leopard	Wilhelmshaven	1927 1927 1928	304	28½	8¾	2	800	25,000	34	3 4·1-in. 2 1-pr.	6 19·7 in. (T.)	115	— 300
Seeadler .. .. Greif .. .. Albatros .. .. Kondor .. .. Falke .. .. Möwe	Wilhelmshaven	1926 1926 1926 1926 1926 1926	287¾	27½	9¼	2	800	24,000	33	3 4·1-in. 2 1-pr.	6 19·7 in. (T.)	111	— 300
*G. 11 .. .. *G. 10 .. .. *G. 8 .. .. *G. 7	Germania Works, Kiel	1911 | 1912	233 †	25	10	2	760	16,000	25	2 4·1-in., 7 M.	2 19·7 in.	90	140 60
TORPEDO BOATS—													
T. 1–12	..	Bldg.	..	..	..	..	600	..	..	..	..	..	..
T. 196 .. .. .. T. 190	Vulcan Works, Stettin	1911 1910	243	26	10	..	800	18,000	25	2 4·1-in., 2 M.	2 19·7 in.	98	160 54
SUBMARINES—													
U 1–6, 13–17 .. .. U 7–12, 17–24	Deutsche Werke, Kiel Germania Werft, Kiel	1935 | 1936	136½	13	12½	..	250 —	700 —	13 7	1 1-pr.	3 21 in.	23	..
U 25–26	Deschimag, Bremen	1936	232½	20½	13⅓	..	712 —	..	..	1 4-in. 1 1-pr.	6 21 in.	40	..
U 27–32 .. .. .. U 33–36	Deschimag, Bremen Germania Werft, Kiel	1936	206⅔	19	13	..	500 —	..	..	1 3·5-in. 1 1-pr.	5 21 in.	35	..
U 37–44	..	Bldg.	..	..	..	..	740	..	..	..	..	..	..
U 45–51	..	Bldg.	..	..	..	..	517	..	..	..	..	..	..

* Classified as torpedo boats in German official lists.

† Length increased during alterations, 1929–30.

Greece.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Hydra .. .. .. Conduriotis	Odero, Genoa	1931	308·8	30·3	10·5	2	1230	30,000	40	4 4·7 in., 4 2-pr. A.A.	6 21-in. (T.)	156	/ 630
Spetsai .. .. .. Psara			308·8	30·3	11·3	..	1308						
Thyella .. .. .. Sphendoni	Yarrow ..	1906	220	20·6	9·0	2	305	6000	30	2 3-in. 1 2-pr.	2 18-in.	70	80 / —
Niki .. .. Aspis	Stettin (Vulcan)	1906	220	20·6	9·0	2	275	6000	30	2 3-in., 4 6-pr.	2 21-in.	70	80 / —
*Aetos, *Leon, *Panther, *Ierax ..	Birkenhead	1911	293	27·7	9·6	..	1013	19,750	32	4 4-in., (Panther and Aetos, 40 mines)	6 21-in. (T.)	110	— / 260
TORPEDO BOATS—													
Arethusa.. .. .. Doris .. .. .. †Aigli .. .. .. †Alkyonis	Stettin (Vulcan)	1913	147·8	9	4	..	142	2400	25	2 6-pr.	3 18-in.	..	25 /
‡Pergamos .. .. ‡Proussa	Fiume	1914	178·4	18·8	5	..	237	5000	28½	1 11-pr.	2 18-in.	25	..
‡Kios.. .. .. .. ‡Kyzikos .. .. .. ‡Kydonia..	Monfalcone												
SUBMARINES—							Surf. / Sub.		Surf. / Sub.				
Katsonis	Schneiders, Harfleur	1926	203½	17·7	12·3	2	567 / 760	1300 / 1000	14 / 9·5	1 4-in., 1 2-pr. A.A.	6 21-in.	30	..
Papanicolis	Ch. de la Loire, Nantes												
Nereus .. .. .. Proteus .. .. .. Triton	Ch. de la Loire, Nantes	1927 1927 1928	226½	18½	12·6	2	689 / 945	1500 / .200	14 / 9·5	1 4-in., 1 2-pr. A.A.	8 21-in.	45	..
Glaucos	Ch. de France, Caen	1928											

The work will be spread over a number of years. Two destroyers building by Messrs. Yarrow.

* Reconstructed by Messrs. J. S. White & Co., Cowes, 1924–25. † On sale list.

‡ Surrendered Austrian torpedo-boats employed on police duties.

Italy.

Name or Number.	Where Built.	Launched.	Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
*FLOTILLA LEADERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
U. Vivaldi .. .. A. Usodimare ..	Genoa (Odero)	1929 1929	353	33·6	17	2	1628	50,000	38	6 4·7-in. (in pairs) 6 2-pr. A.A. (L. Malocello has 4 1·5-in. A.A.). Carry mines	6 21-in. (T.)	185	— / 500
L. Tarigo .. .. L. Malocello	Genoa (Ansaldo)	1928 1929											
L. Pancaldo .. .. A. Da Noli	Riva Trigoso (Cant. Navali)	1929 1929											
E. Pessagno .. .. N. Da Recco	Ancona (Cant. Navali)	1929 1929											
N. Zeno .. .. .. G. Da Verazzano .. A. da Mosto .. .. A. Pigafetta	Fiume ..	1928 1928 1929 1929											
Leone .. .. .. Pantera .. .. .. Tigere	Ansaldo ..	1923 1924 1924	372	34·3	11·5	2	1525	42,000	34	8 4·7-in. (in pairs), 2 3-in. A.A., 60 mines.	6 18-in. (T.)	210	— / 359
Aquila	Pattison ..	1916	310	31	10	2	1407	39,800	36·5	4 4·7-in. (in pairs), 2 3-in. A.A., 50 mines	4 18-in. (D.)	140	— / 260
Falco	Pattison ..	1916					1285						
Premuda .. .. .. (ex-German V116)	.. .. ..	1918	353	34	14·2	2	1526	48,000	36	4 5·9 in., 2 2-pr. A.A.	4 19·7in. (D.)	150	— / 720
Augusto Riboty .. Carlo Mirabello ..	Ansaldo ..	1915 1914	340	32·2	9·8	2	1382	35,000	35	8 4-in., 4 2-pr. A.A., 100 mines.	4 18-in. (D.)	150	/ 344
DESTROYERS—													
Camicia Nera .. Ascari .. .. .. Corazziere .. .. Pontiere .. .. Aviere .. .. .. Artiglere	Odero-Terni Orlando	Bldg.	350	33·4	10·9	2	1620	48,000	39	4 4·7-in.	6 21-in.	..	..
Carabiniere .. .. Lanciere..	Cartieri Dell' Tirreno Riva Trigoso	Bldg.	350	33·4	10·9	2	1620	48,000	39	4 4·7-in.	6 21-in.	..	..
Granatiere .. .. Bersagliere	Cartieri Navali Rivniti Palerino	Bldg.	350	33·4	10·9	2	1620	48,000	39	4 4·7-in.	6 21-in.	..	..
Fuciliere .. .. Alpino	Cantieri Navali di Ancona	Bldg.	350	33·4	10·9	2	1620	48,000	39	4 4·7-in.	6 21-in	..	..
Lira .. .. .. Lupa .. .. .. Lince .. .. .. Libra	Cantiere Naval del Quarnaro Fiume	Bldg.	267	26	7·9	2	679	19,000	34	3 3·9-in.	4 18-in.	..	..
Chio .. .. .. Calliope .. .. .. Calipso .. .. .. Circe	Ansaldo, Genoa	Bldg.	267	26	7·9	2	679	19,000	34	3 3·9-in.	4 18-in.	..	..

* Designated scouts in Italian official lists.

Destroyers including [illegible] class 59 – TBS · 32.

	Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal. Oil.
	DESTROYERS—*Contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
	Alcione Airone Ariel Aritusa	Ansaldo, Genoa	Bldg.	267	26	7·9	2	679	19,000	34	3 3·9-in.	4 18-in.	..	..
Small	Polluce Partenope Pleiade Pallade	Naples	Bldg.	267	26	7·9	2	679	19,000	34	3 3·9-in.	4 18-in.	..	..
4	L. Oriani V. Alfieri V. Gioberti Cr. Carducci	Orlando.	1936	343	33½	10	2	1498	48,000	39	4 4·7-in. 8 smaller A.A. guns	6 21-in.	..	..
Small 16	†Aldebaran †Altair †Andromeda †Antares †Canopo †Cassiopea †Castore †Cigno †Sagittario †Vega	Ansaldo Ancona Fiume	1936	267	27	8½	2	642	19,000	34	3 3·9-in 8 1·5-in.	4 18-in.	..	..
	†Centauro †Climene †Sirio †Perseo	Ancona Fiume	1935 1935	..	..	..	..	652	19,000	34	3 3·9-in. 2 smaller A.A. guns	4 18-in.	..	..
	†Spica †Astore	Partenopei, Naples	1934 1934	256	26	8·5	..	615	19,000	35	3 3·9-in 6 smaller	..	..	..
4	Maestrale Grecale Libeccio Scirocco	Fiume Ancona Ancona Genoa	1934 1934 1934	350	33½	10	2	1449	44,000	38	4 4·7-in., 4 smaller A.A.	6 21-in.	153	..
4	Dardo Strale Freccia Saetta	Odero, Sestri Pozente Cant. Navale di Tirreno, Sestri Levante	1930 1931 1932	311	30	11	..	1206	44,000	38	4 4·7-in. 4 M. A.A.	6 21-in. (T.)	..	oil
4	Folgore Lampo Baleno Fulmine	Cantieri Partenopei, Naples Quarnaro Yard, Fiume	1931	315	30·5	10	2	1220	44,000	38	4 4·7 in. 4 M. A.A.	6 21-in. (T.)	150	oil
8	Borea Zeffiro Espero Ostro Aquilone Turbine Nembo Euro	Ansaldo, Genoa Odero, Genoa Genoa Docks Co.	1927 1927 1927 1928 1927 1927 1927 1927	307½	30	11	2	1073 1092	35,000	36	4 4·7-in., 3 2-pr. A.A. 3 M., 52 mines	6 21-in. (T.)	140	— 340
4	N. Sauro C. Battisti F. Nullo D. Manin	Odero Quanaro, Fiume	1926 1926 1925 1925	295½	30·2	10·5	..	1058	32,000	35	4 4·7-in., 3 2-pr. A.A. 3 M., 52 mines	6 21-in. (T.)	140	— 340
4	Francesco Crispi Giovanni Nicotera Bettino Ricasoli Quintino Sella	Naples (Pattison)	1925 1926 1926 1925	278·6	28·2	10	2	935	28,000	35	3 4·7-in., 2 2-pr. A.A. 2 M., 40 mines	2 dbl. 2 1-in.	106	— 200
	Alessandro Poerio Gulielmo Pepe	Genoa (Ansaldo)	1914	279	26·3	9·3	2	844	20,000	32	5 4-in., 2 2-pr. A.A.	4 18-in. (D.)	100	— 250
	†Impavido †Insidioso †Irrequieto	Naples (Pattison)	1913	239½	24·0	8·4	2	540	13,500	30	5 4-in., 1 2-pr. A.A. 1 M., 10 mines	4 18-in. (D.)	71	— 110
	†Giuseppe Sirtori †Vicenzo Orsini †Francesco Stocco †Giovanni Acerbi	Genoa (Odero)	1916 1917 1916 1916	237¾	24	9·0	2	669	15,000	32–33·8	6 4-in., 4 2-pr. A.A. 2 M.	4 18-in. (D.)	100	— 150
	†E. Cosenz †Giacomo Medici †G. La Farina †Nicola Fabrizi †Angelo Bassini †Giacinto Carini †G. La Masa	Genoa (Odero)	1918 1917 1918 1917 1917 1917 1917	237¾	24	9·0	2	635	15,500	31–34	4 4-in., 2 3-in., 2 M. 10 mines.	4 18-in. (D.)	100	— 150
	†Fratelli Cairoli †Antonio Mosto †Rosolino Pilo †Giuseppe Abba †Ippolito Nievo	Naples (Pattison) Genoa (Odero)	1914	239	24	8·8	2	615	14,500	30	5 4-in., 2 2-pr. A.A. 2 M.	4 18-in. (D.)	71	— 150
	Cesare Rossarol, *ex*-German B97	Hamburg	1915	..	30·6	9·5	2	744	40,000	34	3 4·7-in., 2 3-in. A.A. 24 mines	4 19·7in. (D.)	114	— 526
	*Simone Schiaffino *Giuseppe Dezza *Giuseppe Missori	Genoa (Odero)	1914 1914 1915	236	24	8·8	2	615	13,500	30	5 4-in., 2 2-pr. A.A. 2 M.	4 18-in.	71	— 150
	*Gen. A. Cantore *Gen. A. Chinotto *Gen. A. Papa *Gen. A. Cascino *Gen. M. Prestinari *Gen. C. Montanari	Genoa (Odero)	1921 1922	240⅓	24	9·0	2	635	18,000	30	3 4-in., 2 3-in. A.A. 2 M.	4 18-in. (D.)	100	— 150

* Designated torpedo boats in Italian official lists. † Minelayer.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal / Oil
DESTROYERS—*contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Audace (*ex*-Japanese Kawakaze)	Yarrow	1917	287	27·5	8·3	2	628	21,500	34·5	7 4-in., 1 2-pr. A.A., 2 M.	4 18-in. (D.)	111	— / 252
Ardimentoso, *ex*-German S. 63	Schichau	1915	272	27·3	8·6	2	803	24,000	33	3 4-in., 2 3-in., 24 mines	4 19·7in. (D.)	98	— / 305
Solferino, Palestro S. Martino, Curtatone Confienza, Castelfidardo, Calatafimi, Monzambano	Leghorn (Orlando)	1921 1922 1923	269 283½	26·5	8·6	2	860 966	18,000	32–33·5	4 4-in., 2 3-in. A.A., 2 M., 24 mines	4 18-in. (D.)	115	— / 170
Cortellazzo Grado Monfalcone Zenson (*ex*-Pola)	Danubius *ex*-Austrian	1917 1913	274	25·5	8·2	2	561 594	22,000	32	2 3·9-in. 4 3-in. 6 smaller	4 18-in. (D.)	102	110 / 140
TORPEDO BOATS—													
Albatross	Orlando	1934	231½	22½	6	2	340	4,000	24·5	2 3·9 in.	2	..	..
O.L.T., 75		1918	139·5	15	5·5	2	169	3,400	28–29	2 3-in. A.A.	2	..	..
SUBMARINES—													
Marcello Mani Barbarigo Veniero Provana Dundolo Morosini Mocenigo Emo	..	Bldg.	239½	23·5	15·5	2	941	3,000	17	2 3·9-in. 2 A.A.	8 21-in.	..	..
Brin Galvani Guglielmotti	..	Bldg.	231·4	22½	13½	2	896	3,000	17	1 4·7-in. 4 A.A.	8 21-in.	..	..
Adua Alagi Aradam Ascianghi Axum Dagabue Dessie Condor Macalle Neghelli Uebi-Scebeli Uarsheich Scire Tembien Durbo Mafole Beiul	..	1936	197	22	..	..	675 / 855	..	..	..	..	..	..
Argo Velella	Adriatico	1936	..	..	..	..	676	..	..	1 3·9-in. 2 M.G.	6 21-in.	..	..
Perla Diaspro Gemma Berillo Turchese Corallo	Montfalcone	1936	..	..	..	..	..	..	..	..	..	..	..
Malachite Ambra Iride Onice	Spezia	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Zoea † Foca †	Taranto	1937	266¾	23½	12⅓	2	1109 / —	2880 / —	17 / 8	1 3·9-in. 2 M.G.	6 21-in.	..	..
Calvi † Finzi † Tazzoli	Spezia	1935	275	24·5	13	..	1332 / 1965	4400 / 1800	17 / 8·75	2 4·7 in.	8 21-in.	..	..
Diamante Smeraldo	Taranto	1933	202	18·5	15	2	590 / 787	1,350 / 800	14 / 8·4	1 3·9-in.	6 21-in.	..	..
Rubino & Topasio	Fiume												
Zaffiro & Amestista	Orlando												
Sirena, Naiade, Nereide, Anfitrite, Galatea, Ondina	Monfalcone												
Archimede, Galileo, Torricelli, Ferraris	Taranto	1934	231½	22½	13	2	880 / 1231	3,000 / 1,300	17·5 / 8·5	1 3·9-in.	8 21-in.	..	
Glauco † Otaria †	Monfalcone	1934	240	23½	14½	2	860 / 1167	3,000 / 1,040	17·0 / 8·5	2 3·9-in.	8	..	..
Pietro Micca †	Taranto	1935	296	25½	17·5	..	1371 / 1883	3,200 / 1,500	16·0 / 8·5	2 4·7-in., 1 smaller	6 21-in.	..	..
Squalo, Narvalo, Delfino, Tricheco	Cantiere N., Triestino	1930	229	19	14·5	..	810 / 1077	3,000 / 1,400	16·5 / 9	1 4-in.	6 21-in.	64	..
Argonauta, Fisalia, & Medusa	Cantiere N., Triestino	1931	200	19·5	13	..	599 / 791	1,200 / 800	14 / 8·5	1 4-in.	6 21-in.	..	..
Jalea & Jantina	Odero-Terni	1932											
Serpente (*ex*-Nautilus) & Salpa	Taranto												

* Designated torpedo boats in Italian official lists. † Minelayer.

Italy—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal/Oil
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—*contd.*													
Santorre Santarosa Ciro Menotti	Ansaldo	1929	230	19	15·5	..	815/1078	3,000/1,300	17·5/9	1 4-in.	8 21-in.	50	..
Fratelli Bandiera Luciano Manara	Monfalcone	1929											
Luigi Settembrini Ruggiero Settimo	Taranto	1930					797/1134	3,000/1,400					
E. Fieramosca	Taranto (Tosi)	1930	277	27	16·8	..	1340/1760	6,000/2,000	19/10	1 4·7-in. 1 3·9-in.,	8 21-in.	..	—/80
M. Bragadino F. Corridoni	Taranto (Tosi)	1929 1930	233	18·6	14	2	802/1051	1,500/1,000	14/8	1 4-in., 24 mines	4	..	—/41
Ballila A. Sciesa E. Toti D. Millelire	Spezia, Ansaldo	1927 1928 1928 1927	285	25·6	14	..	1368/1874	4,400/2,200	18·5/9	1 3·9-in.	6 21-in.	..	—/140
V. Pisani M. Colonna Da. Geneys G. Bausan	Montfalcone, Trieste	1927 1927 1928 1928	223	18·7	13·8	..	791/1040	3,000/1,000	17·5/9	1 4-in. 1 M.	6 21-in.	..	—/48
G. Mameli P. Capponi T. Speri G. Da. Procida	Taranto	1926 1927 1928 1928	213·3	21·5	13	..	770/994	3,000/1,000	17/9	1 4-in.	6 21-in.	..	—/48
L. Mocenigo L. Galvani	Venice	1918 1919	211·7	20·3	15·6	..	780/900	2,600/1,300	17/10	2 3-in., 1 M.	6 18-in.	32	—/50
X 2, 3	Ansaldo	1916	139·9	18	11	..	390/460	660/360	10/6·3	1 3-in. A.A. 1 M., 18 mines	2 18-in.	..	—/8
H 1, 2, 3, 4, 6, 8	Vickers	1917	150·3	15·8	12	..	336/466	620/480	13/10	1 3-in. A.A. 1 M., H1, 4, and 6 only	4 18-in.	22	—/18

Japan.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Compliment.	Fuel. Coal/Oil
			Length (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS:													
FIRST CLASS—													
Arashio			Bldg.									200	
Oshio													
Mitsushio													
Asagumo													
Minegumo													
Kasumi													
Yamagumo													
Natsagumo													
Kinone													
Yudachi	Sasebo	1935–1936	336	32	..	..	1368	37,000	34	5 5-in. 2 M.G.	8 21"	200	..
Harusame	Maizuru												
Samidare	Uraga												
Umikaze	Maizuru												
Yamakaze	Uraga												
Kawakaze	Sasebo												
Suzukaze	Uraga												
Asashio	Maizuru												
Murasame	Sasebo												
Shigure	Uraga												
Shiratzuyu	Sasebo												
Hatsushima	Uraga	1933–1934	338	32·7	8·8	..	1368	37,000	34	5 5-in. guns	9	200	..
Ariake	Kawasaki												
Yugure	Maizuru												
Wakaba	Sasebo												
Nenohi	Uraga												
Hatsuhara	Sasebo												
Oboro	Sasebo	1929–1932	368 b.p.	34	10·7	..	1700	40,000	34	6 5-in., 2 M.	9 21-in.	200	..
Akebono	Fujinagata												
Sazanami	Maizuru												
Ushio	Uraga												
Akatsuki	Sasebo												
Hibiki	Maizuru												
Ikazuchi	Uraga												
Inazuma	Fujinagata												

Japan—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length (extreme).	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—*contd.*													
FIRST CLASS—*contd.*													
Sagiri	Uraga	1929	368 b.p.	34	10·7	..	1700	40,000	34	6 5-in., 2 M.	9 21-in.	210	..
Asagiri	Sasebo	1929											
Yugiri	Maizuru	1930											
Amagiri	Tokyo	1930											
Shikinami	Maizuru	1929											
Ayanami	Fujinagata	1929											
Fubuki	Maizuru	1927											
Shirayuki	Yokosuka	1928											
Hatsuyuki	Maizuru	1928											
Murakumo	Fujinagata	1928											
Shinonome	Sasebo	—											
Usugumo	Ishikawa-jima (Tokyo)	1927 1927											
Shirakumo	Fujinagata	1927											
Isonami	Uraga	1927											
Uranami	Sasebo	1928											
Minadzuki	Uraga	1926	320 b.p.	30	9·8	2	1315	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	148	— 400
Fumitsuki	Fujinagata	1926											
Nagatsuki	Ishikawajima	1926											
Kikudzuki	Maizuru	1926											
Mikadzuki	Sasebo	1926											
Mochidzuki	Uraga	1927											
Yudzuki	Fujinagata	1927											
Yayoi	Uraga	1924, 25											
Udzuki	Ishikawajima	1925											
Mutsuki	Sasebo	1924, 25											
Kisaragi	Maizura	1925											
Satsuki	Fujinagata	1925											
Oite	Uraga	1924, 25											
Hayate	Ishikawajima	1925											
Yunagi	Sasebo	1924, 25											
Kamikaze **Asakaze**	Nagasaki	1922	320 b.p.	30	9·6	..	1270	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	148	— 400
Harukaze **Matsukaze** **Hatakaze**	Maidzura	1922–24											
Asanagi	Fujinagata	1924											
Sawakase	Nagasaki	1919–22	320 b.p.	29·25	9·5	2	1215	38,500	34	4 4·7-in. 2 M. A.A.	6 21-in.	149	— 400
Okikase, Shimakase, Nadakase, Yukase,													
Hakase, Minekase	Maidzuru												
Namikase, Numakase, Nokase, Tashikase, Shiokase, Hokase, Yakase, Akikase	Mitsubishi, Kawasaki, Maidzuru	1920–22											
Urakase	Yarrow	1915	287·3	27·6	9·5	—	810	22,000	28	1 4·7-in., 4 3-in.	4 21-in.	116	— 248
SECOND CLASS—													
Wakatake **Kuretake**	Kawasaki, Kobe	1922	275 b.p.	26·5	8·3	..	820	21,500	31·5	3 4·7-in., 2 M. A.A.	4 21-in.	110	— 250
Fuyo **Karukaya**	Fujinagata	1922, 23											
Asagao **Yugao**	Ishikawa-jima	1922–23											
Sanaye	Uraga	1923											
Yanagi, Momo	Sasebo	1916–18	275·0 b.p.	25·3	7·9	2	755	16,000	31·5	3 4·7 in., 2 M.	6 18-in.	109	92 212
Kashi, Hinoki	Maidzuru												
Kaya	Yokosuka	1917–19	275·5 b.p.	26	8	2	770	21,500	31·5	3 4·7 in., 2 M. A.A.	4 21-in.	80	— 290
Nashi, Kaki, Take	Kawasaki												
Kuri	Kure												
Nire, Tsuga	Ishikawa-jima												
Hagi	Uraga	1920–1922	275·5 p.p.	26	8	2	770	21,500	31·5	3 4·7 in. 2 M., A.A.	4 21-in.	80	— 290
Susuki, Yomogi **Sumire**	Ishikawa-jima												
Hishi, Hasu	Uraga,												
Tade, Fuji	Fujinagata,												
Aoi, Kiku **Tsuta, Ashi,**	Kawasaki												
TORPEDO BOATS—													
Chidori	Maizuru	1933	254	24	6	..	about 527	7000	26	3 4·7 in.	2	..	..
Manazuru	Fujinagata												
***Tomazuru**	Maizuru	1933											
Hatsukari	Fujinagata												

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* Capsized in 1934 but has been repaired and put into commission again.

Japan—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length (extreme).	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel· Coal/Oil
TORPEDO BOATS—*contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Otari	Maizuru	1935	263	26	6¾	..	595	9000	28	3 4·7 in. 1 M.G.	3 21 in.	..	..
Hyodori	Ishikawa-jima												
Hayabusa	Yokohama												
Kasasagi	Osaka												
Kari													
Sagi													
Haro													
Kiji													
Further eight in No. building.													
SUBMARINES—							Surf./Sub						
I68	Kure	1933	331	27	13	..	1400/—	..	20/—	1 4·7 in.	6	60	..
I69	Kobe	1934											
I70	Sasebo												
I71	Kawasaka												
I72 and I73	..	1935	..	..	..	..	1400/—						
I74 and I75	..	1936											
I8	Kawasaki	1935	331	27	13	..	1950/2500	6000/—	17/—	2 5·5 in.	..	60	..
I7													
I6	Kawasaki	1934	320	30	15·7	..	1900/2500	6000/—	17/—	2 5 in.	6 21-in.	60	..
I5													
I65	Kure	1931	321	25·6	15·9	..	1638/2100	6000/1800	19/9	1 4-in. 1 M.	6 21-in.	70	..
I66	Sasebo												
I67	Kobe												
I61	Mitsubishi	1929	320½	25·7	16	..	1635/2100	6000/1800	21/7·9	1 4·7 in.	6	56	—/255
I62	Kobe	1928											
I64	Kure	1929											
I4	Kawasaki	1929	320	30·2	15·7	..	1955/2480	6800/1800	17/9	2 5·5 in. 1 M.	6 21-in.	61	—/520
I1, I2, I3	Kawasaki	1926											
†I21	..	1927	279½	24·6	14	..	1142/1470	2400/1200	14/9·5	1 5·5-in.	4	45	..
†I22	Kawasaki	1928											
†I23		1928											
†I24		1928											
I53	Kure	1927	331½	26	16	..	1635/2100	6000/1800	21/7–9	1 4·7-in.	8 21-in.	56	—/255
I55	Kure	1927											
I56	Kure	1929											
I54	Sasebo	1927											
I63	Sasebo	1928											
I60	Sasebo	1929											
I59	Yokosuka	1929											
I58	Yokusuka	1928											
I57	Kure	1929											
Ro. 33	Kobe	1934	..	..	..	..	700	1200	16/—	1 3-in. A.A.	..	..	..
Ro. 31	Mitsubishi	1927	243½	20	12·4	..	655/1000	1200/1200	13/10	1 3-in.	6	43	—/75
Ro. 65	Mitsubishi	1926	250	24·2	12·4	..	988/1300	2400/1800	16/10	1 3-in. 1 M.	6	47	—/75
Ro. 66	Mitsubishi	1927											
Ro. 67	Mitsubishi	1927											
Ro. 68	Mitsubishi	1925											
Ro. 64	Mitsubishi	1925											
Ro. 63, 62, 61	Mitsubishi	1924											
Ro. 60	Mitsubishi	1923											
I. 51‡	Kure	1924	300	28·7	15	..	1390/2000	6000/1800	19/7–9	1 4·7-in.	8	..	—/190
I. 52		1925	330	25	16·8								
Ro. 32, 30	Kawasaki Kawasaki	1924 1923	243·5	20	12·4	..	655/1000	1200/1200	13/10	1 4-in.	4	43	—/75
Ro. 28	Sasebo	1923	230 b.p.	20·1	12	..	746/1000	2600/1200	16/10	1 3-in. 1 3-pr.	4 21-in	45	—/75
Ro. 27	Yokosuka	1924											
Ro. 26	Sasabo	1922											
Ro. 59	..	1923	250	23·5	13	..	889/1082	2400/1200	17/10·5	1 3-in. 1 3-pr.	4 21-in.	65	—/76
Ro. 58, 57	..	1922											
Ro. 56, 55	Mitsubishi	1922	231·5	23·5	13	..	893/1082	2400/1200	17/10·5	1 3-in. H.A. 1 3-pr.	6 18-in.	65	—/76
54, 53	Mitsubishi	1921											
51	Mitsubishi	1920											

† Fitted for minelaying. ‡ Carries small seaplane.

Netherlands.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-power.	Maximum speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal. / Oil.
			Feet.	Feet.	Feet.		Tons.		Knots				Tons
DESTROYERS—													
*Banckert ..	Burgerhout	1929	321·5	31	9·8	2	1316	31,000	34	4 4·7-in., 1 3-in. A.A., 4 1-pr., 4 M. 1 seaplane 24 mines	6 / 21″	126	— / 330
*Van Nes ..	Rotterdam	1930											
*Van Galen	Fijenoord	1928											
*Witte de With	Rotterdam	1928											
Van Ghent	Flushing	1926	321·5	31	9·8	2	1316	31,000	34	4 4·7-in. 2 3-in. A.A. 24 mines 1 seaplane	6 / 21″	126	— / 330
*Evertsen ..	Rotterdam	1926											
*Piet Hein ..		1927											
*Kortenaer		1927											
1ST CLASS TORPEDO BOATS—													
G 13, 15 and 16 ..	Scheldt Fijenoord	1913–1914	162·5	17·3	9·0	..	150	2,600	25	2 3-in.	3 / 17·7″	27	40 / —
Z 3	Amsterdam	1916–1917	201	20·4	6	2	277	5,500	27	2 3-in., 2 M.	4 / 17·7″	39	61 / 8
Z 5–8 ..	Scheldt Fijenoord	1915	192	19·8	5·5	2	264	5,500	27	2 3-in., 2 M.	4 / 17·7″	39	70 / 7
SUBMARINES—							Surf. / Sub.						
K XIV ..	Rotterdam	1932–3	242	21·5	13·3	..	810 / 1,000	3000 / 1000	17 / 9	1 3·5-in., 2 2-pr.	6	..	..
K XV ..													
K XVI ..													
K XVII ..	Fijenoord		242	20·3	12·5	..	770 / 1,030	3,200 / 1,000	17 / 9	1 3·5-in., 2 2-pr.	4 / 21″	35	...
K XVIII ..													
K XIX ..	Rotterdam	Bldg.	..	..	..	..	765 / 1,020	..	..	..	..	..	..
K XX ..													
K XXI ..		Bldg.											
K XXII ..													
O 12 ..	De Schelde	1931	199	18·7	11·5	..	560 / 700	1,900 / 600	15 / 8	2 1·5-in. A.A.	5 / 21″	..	..
O 13 ..													
O 14 ..													
O 15 ..													
O 16 ..	De Schelde	Bldg.	254	21·5	13	..	878 / —	3,200 / 860	18 / 9	1 3·5-in. 2 1·5-in.	5 / 21″	..	..
†K XIII ..	Fijenoord	1924	218·8	20·2	12·2	..	660 / 810	2,400 / —	15 / 8	1 22-pr., 1 maxim	6	31	— / 45
†K XII ..													
†K XI ..													
O 11.. ..	Fijenoord	1925	179½	18·7	11½	..	506 / 627	900 / —	12¾ / 9	1 22-pr. A.A., 1 maxim	5 / 21″	29	— / 21
O 10 ..	Amsterdam												
O 9	Flushing												
O 8 (ex-British H6)	..	1914	150·3	15·8	12·3	..	364 / 434	480 / 320	13 / 8·5	1 maxim	4 / 17·7″	26	— / 18
O 7	Fijenoord	1916	112	12·8	9·5	..	177 / 206	350 / 185	11·5 / 8·5	1 maxim	3 / 17·7″	12	— / 5·4
O 6	De Schelde	1916	115·9	12·8	9·5	..	187 / 226	350 / 185	11·5 / 8·5				
†K X ..	De Schelde	1923	212	18·3	11·9	..	560 / 690	1,550 / 630	15 / 8	1 22-pr. 1 maxim	4 / 17·7″	29	— / 45
†K IX ..		1922						1,550 / 630					
†K VIII ..		1922						1,800 / 630					
†K VII ..	Fijenoord	1921	177·2	16·8	12·5	..	550 / 630	1,200 / 600	15 / 8	1 3-in., 1 maxim	6 / 17·7″	29	— / 76
†K VI ..		1920											
†K V		1919											
†K II.. ..	Fijenoord	1919	172·3	16·8	12·5	..	550 / 600	1,800 / 600	15 / 8	1 3-in., 1 maxim	6 / 17·7″	29	— / 76

* Dutch East Indian Fleet.

† Indian Military Marine.

Norway.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Draug, Troll, Garm	Horten ..	1908–13	226	23·5	8·8	2	540	7,500 (Garm 8,000)	27·0	6 3-in. Draug has 6 4·7-in. in addition	3 18-in.	71	95 / 6
Torpedo Boats:													
First Class—													
Snogg, Stegg, Trygg	Horten ..	1919-1920	173·9	18	5¼	2	250	3,500	25	2 3-in.	4	31	30 / —
Storm, Brand ..	Horten ..	1900	130·0	16·0	6·9	1	100	1,100	21	2 M.	2	19	17 / —
Laks, Sild, Sael, Skrei	Horten ..	1901	126·4	15·0	6·9	1	100	1,150	21·8	2 M.	2 18"	19	
Sleipner, Aegir ..	Horten ..	1936	236·3	25·5	6·9	..	560	12,500	30	3 4-in., 1 1·5-in. A.A.	4 21"	..	..
Second Class—													
*Kjek, Hvas, Kvik, Blink Lyn, Hauk, Falk	Fredrikstad Horten ..	1898 1903	114·5	14·5	6·0	1	73	650–750	19–20	2 M.	2 18"	14	11 / —
Skarv, Teist	Horten ..	1906–7	133	14·5	6·5	1	100	1,600	25	2 3-pr.		18	16 / —
Lom, Jo, Grib.. ..			117	14·5	5·7	1	72	1,100	23	2 M.		16	15 / —
Ravn, Orn	Horten ..	1903	113	14·5	5·7	1	73	850	23	2 M.		16	
Kjell	Horten ..	1912	135	14·9	6·4	1	100	1,800	25	2 3-pr.		19	15 / —
Submarines—													
A 2, 3, 4	Germania Kiel	1909 to 1913	133·2	15·7	8·9	2	246 / 332	900 / 380	14 / 7	—	3 18"	17	— / 12·8
B 1, 2	Horten ..	1922	167·3	17·5	10·5	2	413 / 545	900 / 640	14·5 / 10	1 12-pr.	4 18"	23	— / 21
B 3, 4	Horten ..	1923–24											
B 5, 6	Horten ..	1929											

* Employed as patrol ships.

Soviet Union.

Some of the details given below are uncertain.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Felix Dzerzhinski Petrovski .. Nezamojni .. Shaumyan ..	Ship & Eng. Co., Nikolaev	1917	303·5	29·5	10·5	..	1326	29,000	33	4 4-in., 2 7-pr., 4 M., can carry 80 mines	12 18" (T.)	120	— / 390
Karl Marx .. Kalinin	Revel.. ..	1915	344·5	31·3	9·7	..	1350	32,700	35	5 4-in., 1 3-in. A.A., carries mines	9 18" (T.)	110	— / 400
Uritsky .. .. Volodarski ..	Leningrad..	1914	321·5	30·5	9·25	..	1610	32,000	35	4 4-in., 1 3-in. A.A., 2 M., 80 mines	9 18" (T.)	110	— / 400
Rykov .. .. Engels .. .. Stalin .. .. Artem .. .. Volkov .. .. Lenin		1914 | 1915	314·75	30·5	9·75	..	1260	30,000	35			110	— / 350
Frunze	Leningrad..	1914	336	31·1	9·8	..	1100	23,000	34	4 4-in., 1 3-in., 4 M.	6 (D.)	120	— / 350
C Class Guard Ships—													
Shtorm .. .. .. Shkval	.. ..	1932	236	24	10	2	700	13,200	29	2 4-ins., 4 MG.	3 18"	72	..
Groza, Metali, Smertsch, Taifun, Uragan, Wiche, Wiuga, Zyklon	..	1933–35	236	24	10	2	700	13,200	29	2 4-in., 4 MG.	3 18"	72	..

Soviet Union—*continued.*

Name or Number.	Where Built.	Date of Completion.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—													
Chartist	..	1930–1933	..	..	..	..	1039/1335	..	..	1 4-in., 1 M.G.	6 21″	..	..
Garibaldiets	..												
Karbonari	..												
Dekabrist	..	1931	240	23	13¾	..	869/1318	2500/1200	15/8	1 4-in., 1 M.G.	8 21″	44	..
Narodovoleets ..	..												
Krasnogvardeets ..	..												
L 1–3	..	Bldg.											
Jacobinets	..	1931											
Revolusioner ..	..												
Spartakovets ..	..												
6 in number.. ..	..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
35 in number Type M	..	Bldg.	..	..	..	..	200/	..	..	..	..	..	..
20 in number Type Schtsch	..	Bldg.	..	..	..	..	500/	..	..	..	..	..	..
3 in number Type P	..	Bldg.	..	..	..	..	1400/	..	..	..	..	..	..
10 in number ..	..	Bldg.	..	..	..	..	800/	..	..	..	..	..	..
Bolshevik	St. Petersburg	1916–1917	223	14¾	12·6	..	650/790	2400/900	16/9	2 6-pr., 1 M.G.	4 18″	33	—/40
Komissar													
Kommunar													
Tovarisnch													
Krasnoarmeets ..													
Krasnoflotets ..													
Bednyak													
Proletarii													
Batrak													
Rabochi													
Metallist	..	1918–1922	150	15¾	15¼	..	375/467	480/320	13/11	1 6-pr., 1 M.G.	4 18″	28	—/17
Kommunist													
Marxist..													
Politrabotrik ..													
L55 (*ex*-British) ..	..	1917	230	24	13	..	870/1139	2400/1600	17/10	1 4-in., 1 M.G.	6 21″	40	—/78

In addition to the above, forty-five other submarines are building.
There are about thirty-five destroyers and torpedo-boats completed from 1895 to 1912 of very little if any fighting value.
Many of the above vessels are known to be practically useless until very extensively repaired and refitted.

Spain.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Dimensions. Beam.	Dimensions. Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
FLOTILLA LEADERS—													
Gravina	Cartagena ..	1934	333	31·7	10·5	2	1,536	42,000	36	5 4·7-in. 1 3-in. A.A. 4 M.	6 21-in. (T.)	147	—/540
Escano													
Ciscar													
Jorge Juan													
Ulloa													
Almirante Valdés..		1930											
,, Antequera		1930											
,, Miranda		1931											
Churruca		1929											
Alcala Galiano ..		1930											
Lepanto		1928											
José Luis Diez ..		1928											
Sanchez-Barcaiztegui		1926											
Alava		Bldg.											
Linears		Bldg.											
DESTROYERS—													
Alsedo	Cartagena ..	1922	283	27	9	2	1,145	33,000	34	3 4-in., 2 2-pr. A.A.	4 21-in. (D.)	70	—/265
Velasco		1923											
Juan Lazaga		1924											
Villaamil (Minelayer)	Cartagena ..	1913	221¼	22¼	7	..	539	6,250	28	5 6-pr.	4 18-in.	70	80/—
TORPEDO BOATS—													
11 boats	Cartagena ..	1913–1922	164	16·5	6⅓	3	187	3,750	26	3 3-pr.	3 18-in.	31	33/—
SUBMARINES—													
D1	Cartagena ..	1934 1935	276	21·8	13	..	1050/1375	5000/1350	20·5/9·5	1 4·7-in., 4 M.	6 21-in.	..	..
D2 & D3													
C 2–6..	Cartagena ..	1928–1929	247	20·8	13·5	..	900/1270	2000/750	16/8·5	1 4-in., 1 3-in. A.A.	6 21-in.	..	..
Isaac Peral (*ex*-C 1)													
B 1–6	Cartagena ..	1921–24	210	18·9	11·25	..	560/830	1400/850	16/10·5	1 3-in.	4 18-in.	28	—/66

Sweden.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Coal/Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Goteborg	Gothenburg	1935	304	29·6	12½	..	1030	32,000	39	3 4·7-in., 2 1·5-in.	6 21″	120	
Stockholm	Karlskrona	1936											
Klas Horn	Malmo	1931	304·2	29·2	10·5	..	881	24,000–26,000	35	3 4·7-in., 2 2-prs. A.A., 2 M.	2 trpl. 21″	125	—/150
Klas Uggla	Karlskrona												
Ehrensköld	Göteborg	1926											
Nordenskjold	Malmö												
Wale..	Malmo ..	1906	216	20·8	9	2	354	8,000	30	2 3-in., 4 6-prs.	4 18″	69	80/—
Ragnar†	Malmo ..	1909	216	20·8	9	2	354	8,000–9,000	30·0	4 3-in., 2 M.	4 18″ (D.)	67	80/3
Sigurd	Gothenburg	1909											
Vidar	Malmo ..	1909											
Hugin	Gothenburg	1909											
Munin	Malmo ..	1910											
Wrangel †	Gothenburg	1917	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6 18″	72	107/6
Wachtmeister ..													
Malmo	Gothenburg	Bldg.	304	29½	12½	..	1030	32,000	39	3 4·7 in., 4 1-pr.	6 21″	..	..
Karlskroma	Karlskroma												
TORPEDO-BOATS—													
1st Class—													
Castor‡, Pollux‡ ..	Normand & Karlskrona	1908	128	14·5	8·5	1	103	2,000	25	2 6-prs. (except Castor and Pollux which have 2 1-prs.)	2 18″ (‡)	18	20/—
Vega‡	Karlskrona..	1910											
Vesta‡													
Spica, Astrea, Iris, Thetis	Bergsund and Gothenburg	1909											
Altair‡	Stockholm ..	1908											
Antares‡													
Argo‡													
Arcturus‡													
Perseus, Polaris ..	Bergsund ..	1910–1915											
Regulus, Rigel ..	Stockholm ..												
2nd Class—													
2–9	Thornycroft	1906–1908	106	12¾	6½	..	50	750	20	1 1·5-in.	2 18″	14	22/—
SUBMARINES—													
1st Class—													
Ulven	Naval Yard, Karlskrona	1930	217	21	10·8	..	700/850	2800/—	16/9	1 4-in., 1 M.	4 20-in.	32	—/40
Draken		1926											
Gripen		1928											
Bavern	Naval Yard, Karlskrona	1921	187	18·5	9·2	..	500/650	2800/—	15/9	1 3-in., 1 M.	4 18″	..	—/33
Illern													
Uttern													
Sälen	Kockum Co., Malmo ..	1920	177·2	16·2	11 2	..	450/580	..	..	1 3-in., 1 M.	4 18″	..	—/23
Valrossen													
Hajen													
Minelaying Sub.—													
Valen	Karlskrona	1925	187·2	23·2	9·4	..	500	..	..	1 3-in., 1 M.	4 18″	..	—/34
Nordkaparen	Malmo ..	1935	199	20⅔	11	..	500/720	..	15/10	1 4-in.	4 21″	28	..
Delfinen													
Springaren		1936	204	20½	11	..	620/—	..	15/10	1 4·1-in., 2 M.G.	4 21″	32	..
Sjolejonet													

† Fitted for mine-laying.

* Also two motor torpedo-boats, Nos. 3 and 4, 11 tons, 41 knots, 1 M.G. 2 18″ torpedo tubes.

‡ Torpedo-boats marked ‡ have one 18-inch tube only.

United States.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Davis	Bath, I.W. Co.	Bldg.	372	36¼	10½	..	1850	50,000	37	8 5-in. guns 8 M.G.	8 21-in.	175	500
Sampson													
Jouett													
Somers	Federal S.B. & D.D. Co.												
Warrington													
Porter	N.Y.S. Co., Camden	1936											
Selfridge													
McDougal		1936											
Winslow		1936											
Phelps	Bethlehem S.B. Co., Quincy												
Clark													
Moffett													
Balch													
DD426	Boston, N.Y.		334 on W.L.	34¾	9¾	..	1500	42,800	36½	5 5-in. guns 8 M.G.	8 21-in.	190	..
DD425													
DD424	Bath, I.W. Maine												
DD423													
DD422	Bethlehem S. Co. Quincy												
DD421													
Buck	Philadelphia, N.Y.												
Wainwright	Norfolk, N.Y.												
Roe	Charterton N.Y.												
Morris	Norfolk N.Y.												
Walke	Boston N.Y.												
O'Brien													
Russell	Newport News												
Mustin													
Hammann	Federal S.B. & D.D. Co.												
Anderson													
Hughes	Bath, I.W. Co.												
Sims													
Wilson	Puget Sound												
Sterrett	Charterton N.Y.	Bldg.											
Stack	Norfolk N.Y.												
Rowan													
Rhind	Philadelphia N.Y.												
Trippe	Boston N.Y.												
Mayrant	Boston N.Y.												
Maury	Bethlehem S.B. Co.												
McCall													
Lang	Federal S.B. & D.D. Co.												
Ellet													
Benham													
Jarvis	Navy Yard, Puget Sound												
Patterson													
Henley	Navy Yard, Mare Is.												
Ralph Talbot	Navy Yard, Boston												
Mugford													
Helm	Navy Yard, Norfolk												
Blue													
Bagley													
Fanning	United D.D. Co.												
Dunlop													
Craven	Bethlehem S.B. Co.												
Gridley													
Mahan	United D.D. Inc., N.Y.												
Cummings													
Drayton	Bath I.W. Co.												
Lamson													
Flusser	Federal S.B. & D.D. Co.	1936–1937											
Reid													
Case	Navy Yard, Boston												
Conyngham													
Cassin	Navy Yard, Philadelphia												
Shaw													
Tucker	Navy Yard, Norfolk												
Downes													
Cushing	Navy Yard, Puget Sound,												
Perkins													
Smith	Navy Yard Mare Is.												
Preston													
Dale	Navy Yard, N.Y.	1935	334	34½	9½		1,395	42,800	36½	5 5-in. A.A. 8 M.G.	8 21-in (Q)	160	400
Monaghan	Navy Yard, Boston						1,395						
Aylwin	Navy Yard, Philadelphia						1,375						

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—*continued.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Farragut	Bethlehem S.B. Co.	1934	334	34½	9½		1,365	42,800	36½	5 5-in. A.A. 8 M.G.	8 triple (Q	160	400
Dewey	Bath, I.W.Co.						1,345						
Hull	Navy Yard, N.Y.						1,395						
MacDonough	Navy Yard, Boston	1935					1,395						
Worden	Navy Yard Puget Sound						1,410						
Pruitt	Bath, I.W.	1920	314·4	31	9·8	2	1,190	25,000	35	4 4-in., 1 3-in. A.A. (Kane, Fox, Brooks, and Hatfield have 4 5-in. guns.)	4 triple 21-in.	122	375
Sicard													
Preble		1920											
William B. Preston	Norfolk, N.W.	1920						26,000					
Noa		1921											
Hulbert		1920											
Decatur	Navy Yard, Mare Is.	1922											
Perry		1922											
Trever		1922											
Wasmuth		1921											
Zane		1921											
Litchfield		1920											
Meade	Bethlehem S.B. Co., Squantum	1919											
Swasey													
Thornton													
Bailey													
Shubrick													
Ballard													
Greene													
Edwards													
McLanahan													
Laub	Bethlehem S.B. Co., Quincy							27,000					
Gillis													
Aulick													
Welles													
Bancroft													
Osmond Ingram													
Rodgers													
McCalla													
McCook													
Belknap		1919											
Lawrence	New York S.B. Co.	1921						26,000					
Hopkins		1921											
Barry		1920											
Goff		1921											
Bainbridge		1921											
Reuben James		1920											
Williamson													
Sands													
King													
Childs													
Sturtevant													
Overton													
McFarland													
Humphreys													
Kane													
Fox													
Gilmer													
Brooks													
Hatfield													
Paul Jones	Cramp, Pa.	1921											
Truxton													
John D. Ford													
Pillsbury													
Peary													
Pope		1920											
Stewart	Cramp, Pa.	1920	314·4	31	9·8	2	1,190	26,000	35	4 4-in., 1 3-in. A.A. (Parrot, Whipple, Edws. Borie & Tracy have 4 5-in. guns).	4 triple 21-in.	122	375
McCormick													
Bulmer													
Simpson													
MacLeish													
Edsall													
Parrott													
Whipple													
J. D. Edwards													
Borie													
Tracy													

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—*continued.*													
Barker	Newport News S.B. Co.	1919	314·4	31	9·8	2	1,190	26,000	35	4 4-in., 1 3-in. A.A. (Long and Hovey have 8 4-in. in twin mtgs. and 1 3-in. A.A.)	4 triple 21 in.	122	375
Alden													
Broome													
Long													
Hovey													
Southard													
Chandler													
Dallas	Newport News S.B. Co.	1920	314·4	31	9·8	..	1,190	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	375
*Herndon													
Branch													
*George E. Badger		1921											
*Welborn C. Wood		1920											
*Hunt		1920											
*Abel P. Upshur		1920											
Mason		1919											
Satterlee		1920											
Goldsborough													
Dahlgren		1919											
Clemson		1919	314·4	31	9·8	..	1,060	25,000	35	4 4-in., 1 3-in A.A.	4 triple. 21-in.	122	286
DD 185 (*ex* Bagley)													
Abbot													
Haraden													
Thomas		1920	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Hopewell		1920											
Stansbury	Union I.W.	1919											
Howard													
Hogan													
O'Bannon													
Renshaw													
Mackenzie													
Kalk	Fore River S.B. Co.												
Foote													
Maddox													
Cowell													
Crosby													
Walker													
Thatcher													
Palmer		1918											
Herbert	N.Y. S.B. Co.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Schenck													
Leary													
Dickerson													
J. Fred Talbot	Cramp, Phil.		314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Cole													
Ellis													
Bernadou													
Dupont													
Biddle													
Blakeley													
Barney													
Breckenridge													
Roper													
Elliot													
Greer		1918											
Upshur													
Yarnall													
Tarbell													
Hamilton	Mare Island, N.Y.	1919	314·4	31	9·5	..	1,090	24,200	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Claxton		1919											
Ward		1918											
Kennison		1919											
†Kilty		1918											
†Boggs		1918											
Tillman	Bath I.W.	1921						26,000					
Crowninshield		1919						24,200					
Hale													
Aaron Ward													
Buchanan								26,000					
Jacob Jones	New York S.B. Co.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Babbitt													
Twiggs													
Badger													
Tattnall													

† Equipped as targets, wireless controlled. * Operated by the U.S. Coast Guard.

Destroyers Hazelwood, Stoddert and Sinclair are employed as target ships.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Length. (Extreme.)	Beam.	Draught.								
DESTROYERS—*continued.*			Feet.	Feet.	Feet			Tons.	Knots.				Tons.
Lamberton ..	Newport News S. Co.	1919	314·4	31	9·8	..	1060 1090	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Lea .. .. Dorsey .. Dent .. .. Waters .. Talbot .. Rathburne ..	Cramp, Pa.	1918	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A. (Rathburne has 3 4-in.)	4 triple 21-in.	122	286
Crane .. .. Williams .. Chew .. .. Schley ..	Union Plant.	1919 1919 1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	288
Taylor .. Fairfax ..	Mare Island, N.Y.	1918	314·4	31	9·8	..	1,090	27,000 24,200	35	4 4-in., 1 3 in. A.A.	4 triple 21-in.	122	286
McKean .. Ringgold .. Robinson .	Union I.W.	1918	314·4	31	9·9	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Colhoun .. Stringham .. Gregory .. Sigourney .. Little	Fore River S.B. Co.	1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Evans .. .. Philip .. .. Wickes ..	Bath I.W.		314·4	31	9·7	..	1,090	27,000 27,000 24,200	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Manley ..		1917	315·5	30·7	9·5	..	1020	20,000	32	3 4-in., 1 3-in. A.A.	4 triple 21-in.	122	260
Stockton .. Conner ..	Cramp Pa.	1917 1918						18,500	30	5 4-in., 1 3-in. A.A.			
No. 70, *ex*-Craven	Norfolk, N.Y.	1918						18,750	30	4 4-in., 1 3-in. A.A.			
								20,000	32	4 4-in., 1 3-in. A.A.			
Allen	Bath I.W.	1917	315·3	29.9	9·8	..	920	17,500	30	4 4-in. 1 3-in. A.A.	4 triple 21-in.	122	290
†No. 57 *ex*-*Tucker ..	ForeR.S.B.Co	1916	305·8	29·9	10·3	..	910	17,000	29·5	4 4-in.	4 dbl. 18-in.	104	309

* Operated by the **U.S. Coast Guard.**

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement. Surface. / Submerged.	Horse-Power.	Maximum Speed. Surface. / Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
DESTROYERS NOW FITTED AS MINELAYERS—													
Sproston ..	Union I.W.	1919	314·4	30·5	9	2	1,160	27,000	35	4 4-in. 1 3-in. A.A 92 mines	—	107	283
Anthony ..													
Ingraham ..													
Stribling ..	Fore River S.B. Co.	1918											
Ramsay ..	Newport News S. Co.	1918	314·4	30.5	9	2	1,160	25,000	35	4 4-in. 1 3-in. A.A.	—	120	286
Gamble ..													
Breese		1919											
Montgomery													
SUBMARINES—													
Perch	Electric Boat Co.	1936	290	25	14	..	1,330 —	..	..	1 3-in.	6 21"	50	..
Pickerel ..													
Permit ..													
Plunger ..	Portsmouth Navy Yard												
Pollack ..													
Pompano ..	Mare Island Navy Yard	1937											
Salmon ..	Electric Boat Co.	1937	298 W.L.	26	14¼	..	1,450 —	..	..	1 3-in.	6 21"	..	..
Seal		1937											
Skipjack ..													
Snapper ..	Portsmouth Navy Yard	Bldg.											
Stringray ..													
Sturgeon ..	Mare Island Navy Yard												
Sargo ..	Electric Boat Co.												
Saury ..													
Spearfish ..													
Sculpin ..	Portsmouth Navy Yard	Bldg.											
Squalus ..													
Swordfish ..	Mare Island N.Y.	Bldg.											
Sea Dragon	Electrical Boat Co.												
Sea Lion ..													
Sea Raven	Portsmouth Navy Yard												
Seawolf ..													
Porpoise ..	Portsmouth Navy Yard.	1936	283	24·9	13	..	1310	3,000	14	1 3-in.	6 21"	50	..
Pike													
Shark ..	Electric Boat Co.	1936	298	25·1	13·9	..	1315	..	..	1 3-in.		50	..
Tarpon ..													
Dolphin ..	Portsmouth Navy Yard.	1932	307	27·8	13	..	1,540 2,215	4,250 875	17 8	1 4-in.	6 21"	58	..
Cachalot ..	Portsmouth Navy Yard Electric Boat Co.	1934	378¾	24·8	13	2	1,110 1,650	3,100 800	17 8	1 3-in. A.A.	6 21"	45	..
Cuttlefish ..													
Argonaut ..	Portsmouth Navy Yard.	1928	381	33·7	15 4	2	2,710 4,080	3,175 1,200	14·6 8	2 6-in., 60 mines	4 21"	86	..
Narwhal ..	Portsmouth Navy Yard.	1930	371	33·3	16	2	2,730 3,960	5,450 1,270	17 8·5	2 6-in.	6 21"	88	..
Nautilus ..	Mare Island Navy Yard.												
Bonita ..	Portsmouth Navy Yard.	1926	341·5	27	15·5	2	2,000 2,506	6,700 1,200	14 9	1 5-in. (Bass has 1 3-in. A.A.)	6 21"	87	..
Bass ..		1925											
Barracuda		1924											
S48	Lake T.B. Co., Bridgeport	1922	267	21·8	13·5	2	1,000 1,458	2,000 1,500	14·8 11·0	1 4-in.	5 21"	..	237
S47*	Bethlehem Shipbuilding Corp., Quincy Plant	1925	225·3	20·5	16	2	850 1,126	1,200 1,500	14 10	1 4-in.	4 21"	44	154
S46*		1925											
S45*		1925											
S44*		1925											
S43*		1924											
S42*		1924											
S41*	Bethlehem Shipbuilding Corp., Union Plant	1924	219·3	20·5	16	2	800 1,062	1,200 1,500	14·5 11	1 4-in.	4 21"	42	140
S40*		1923											
S39*		1923											
S38*		1923											
S37*		1923											
S36*		1923											
S35*		1923											
S34*		1923											
S33*		1923											
S32*		1923											
S31*		1923											
S30*		1920											

* Designed by Electric Boat Co., Groton, Conn.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface. / Submerged.	Horse-Power.	Maximum Speed. Surface. / Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel Capacity.
			Length. (Extreme.)	Beam.	Draught.								
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
Submarines—*continued.*													
S29*	Bethlehem Shipbuilding Corp., Quincy Plant	1924	219·3	20·5	16	2	800 / 1,062	1,200 / 1,500	14·5 / 11	1 4-in.	4 21″	42	140
S28*		1923											
S27*		1924											
S26*		1923											
S25*		1923											
S24*		1923											
S23*		1923											
S22*		1924											
S21*		1923											
S20*		1922											
S19*		1921											
S18*		1923											
S17	Lake T.B. Co., Bridgeport	1921	231	21·5	13	..	790 / 1,092	2,000 / 1,200	15·25 / 9	1 4-in.	4 21″	38	123
S16		1920											
S15		1921											
S14		1921											
S13	Navy Yard, Portsmouth	1923	231	21·8	13	..	790 / 1.092	2,000 / 1,200	14·75 / 9	1 4-in.	5 21″	38	123
S12		1923											
S11		1923											
S1*	Fore River S.B. Co.	1920	219·3	20·7	16	..	800 / 1,062	1,200 / 1,500	14·5 / 11	1 4-in., 1 aeroplane	4 21″	38	140
R20*	Union I.W.	1918	186·1	18	14·5	2	530 / 680	880 / 934	13·5 / 10·5	1 3-in.	4 21″	30	63
R19*													
R18*													
R17*													
R16*													
R15*													
R14*	Fore River S.B. Co.	1919											
R13*													
R12*													
R11*													
R10*													
R9*													
R7*													
R6*													
R5*													
R4*													
R3*													
R2*													
R1*													
O10*§ ..	Fore River S.B. Co.	1918	172·3	18	14·4	2	480 / 624	880 / 740	14 / 10·5	1 3-in.	4 21″	30	73
O9*§													
O8*§													
O7*§													
O6*§													
O4*§													
O3*§													
O2*§													
O1*§													

* Designed by Electric Boat Co., Groton, Conn.
§ To be disposed of shortly.

The machinery contractors for the vessels of the E. B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn., and the hulls were built under sub-contract from the E. B. Co.

TABLES OF COMPARATIVE NAVAL STRENGTH

TABLE I.—EFFECTIVE FIGHTING SHIPS, BUILT, BUILDING, AND PROJECTED.

Class.	British Empire.			U.S.A.			Japan.			France.			Italy.			Soviet Union.			Germany.		
	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.
Battleships { 14-in. guns and upwards	12	5	—	14	2	2	9	—	2	—	2	—	—	2	2	—	(*h*)	2	—	2	—
Battleships { Below 14-in. guns	—	—	—	1	—	—	—	—	—	5	—	—	4	—	—	4			(5*n*)	2	—
Battle-cruisers	3	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—			—	—	—
Cruisers	59	17	—	29	8	—	33(*e*)	2	—	17	1	2	25	—	—	9	13	3	6	5	2
Cruiser Minelayers	1	—	—	—	—	—	2	—	—	1	—	—	—	—	—	2			—	—	—
Minelayers	5	1	—	4	—	—	21	—	—	2	—	—	15	—	—	—			—	—	—
Armoured Coast Defence Vessels, Monitors, and Netlayers	3 (*a*)	1 (*i*)	—	1	—	—	5	—	—	1	—	—	5	—	—	—			—	—	—
Aircraft Carriers	8 (*b*)	5	—	4(*m*)	3	—	6 (*f*)	5 (*k*)	1	2(*g*)	—	—	1 (*l*)	—	—	1	1		—	2	—
Flotilla Leaders and Destroyers	161	32	—	209(*c*)	46	—	105	9	—	61	8	—	112	30	—	25			22	16	—
Torpedo Boats	—	—	—	—	—	—	8	8	—	7	—	—	2	—	—	—			2	12	—
Submarines	54	19	—	85	17	—	58	4	—	78	12	—	81	25	—	24	77		36	15	—
Sloops	50	5	—	13	—	—	—	—	—	9	2	—	1	1	—	4			10	15	—
Coastal Motor Boats	7	5	—	—	—	—	—	—	—	8	2	—	53	—	—	150			10	2	—
Gunboats and Despatch Vessels	—	—	—	8	2	—	3	—	—	29	—	—	14	4	—	76			20	4	—
River Gunboats	18	3	—	8	—	—	8	—	—	11	1	—	2	—	—	4			—	—	—
Minesweepers	30	15	—	33(*d*)	—	—	12	2	—	16	18	—	48	—	—	38			24	12	—

NOTES:—
(*a*) Includes 1 netlayer.
(*b*) Including 2 seaplane carriers one of which is not regarded as part of the War Fleet.
(*c*) Includes 8 fitted as minelayers.
(*d*) Includes 6 fitted as submarine rescue vessels.
(*e*) There are also 7 old cruisers classed as Coast Defence or Special Service Vessels.
(*f*) Includes 2 seaplane carriers.
(*g*) Includes 1 aviation transport.
(*h*) Blank space indicate that no details are available.
(*i*) Netlayer.
(*k*) Includes 3 seaplane carriers.
(*l*) Seaplane carrier "Miraglia."
(*m*) Includes one aircraft tender.
(*n*) Includes Schleswig-Holstein and Schlesien (1908) employed as training ships.

TABLE II.—BATTLESHIPS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.
		tons.			tons.			tons.						tons.						
1927	Nelson	33,500	1923	Colorado	32,500	1921	Mutsu	32,720		*Building.*			*Building.*						*Building.*	
1927	Rodney	33,900	1923	West Virginia	31,800	1920	Nagato													
1916	Malaya	31,100	1921	Maryland	31,500	1918	Hyuga	29,990		*Richelieu*	35,000		*Vittorio Veneto*	35,000					*2 Battle-ships "F" & "G"*	35,000
1916	Valiant		1920	Tennessee	32,300	1917	Ise			*Jean Bart*			*Littorio*							
1915	Barham		1921	California	32,600	1917	Yamashiro	29,330												
1915	Queen Elizabeth		1919	Idaho	33,400	1915	Fuso													
1915	Warspite	30,600	1918	New Mexico	33,400	1915	Kirishima	29,330												
1916	Royal Sovereign	29,150	1917	Mississippi	33,000	1915	Haruna													
1916	Royal Oak		1916	Arizona	32,600	1913	Kongo													
1916	Revenge		1916	Pennsylvania	33,100															
1916	Resolution		1916	Oklahoma	29,000															
1917	Ramillies		1916	Nevada	29,000															
			1914	Texas	27,000															
			1914	New York																
	Building.																			
	King George V.	35,000		*Building.*																
	Prince of Wales			*Washington*	35,000															
	Anson			*North Carolina*																
	Beatty			*											†					
	Jellicoe																			
	17 ships, including 5 building	543,150		16 ships, including 2 building.	508,200		9 ships †	272,070		2 ships building	70,000		2 ships building	70,000					2 ships building	70,000

* 2 further battleships are projected.

† 2 35,000 battleships are projected.

TABLE III.—BATTLE-CRUISERS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.
		tons.						tons.												
1920	Hood	42,100																		
1916	Renown	32,000																		
1916	Repulse																			
	3 ships.	106,100																		

TABLE IV.—BATTLESHIPS AND BATTLECRUISERS WITH GUNS BELOW 14-IN.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Normal Displacement.	Completed.	Name.	Normal Displacement.
					tons.						tons.			tons.			tons.			tons.
			1912	Arkansas	26,100				1915	Bretagne	22,189	1916	Andrea Doria	21,555	1914	Marat ...	23,606	1936	Admiral Graf Spee	10,000
									1916	Lorraine...		1915	Caio Duilio ...		1914	October Revolution	23,000	1934	Admiral Scheer	
									1916	Provence		1915	Conte di Cavour	21,604	1914	Paris Commune		1933	Deutschland	
									1913	Courbet ...		1914	Giulio Cesare	21,818		Mikhail Frunze	—	1908	Schleswig-Holstein	13,040
									1914	Paris ...								1908	Schlesien	
									1937	Dunkerque	26,500									
										Building:—									*Building:—*	
										Strasbourg	26,500								*Scharnhorst*	26,000
																			Gneisenau	
				1 ship.	26,100					7 ships, including 1 building	163,945		4 ships.	86.532		4 ships.	92,606		7 ships, including 2 building	108,080

TABLE VI.—CRUISERS.

NOTE.—Vessels under construction in italics. Cruisers marked * have guns above 6·1-in.

BRITISH EMPIRE.		
Speed.	Name.	Standard Displacement.
kts.		tons.
32¼	London * ...	9,850
32¼	Devonshire *	9,850
32¼	Shropshire *...	9,830
32¼	Sussex * ...	
31½	Berwick * ...	10,000
31½	Cornwall * ...	10,000
31½	Kent *	9,850
31½	Suffolk * ...	10,000
31½	Cumberland *	10,000
31½	Australia (A) *	9,870
31½	Canberra (A) *	9,850
33	Emerald ...	7,550
33	Enterprise ...	7,580
30½	Effingham ...	9,770
30½	Frobisher ...	9,860
29½	Hawkins ...	9,800
29	Despatch ...	4,850
29	Diomede ...	
29	Durban	
29	Delhi	
29	Dunedin ...	
29	Danae	
29	Dauntless ...	
29	Dragon	
29	Capetown ...	4,200
29	Cairo	
29	Calcutta	
29	Carlisle	
29	Colombo... ...	
29	Cardiff	4,290
29	Coventry ...	
29	Curlew	
29	Ceres	
29	Curacoa	
29	Caledon	4,180
29	Calypso	
29	Caradoc ...	

UNITED STATES.		
Speed.	Name.	Standard Displacement.
kts.		tons.
33·7	Omaha ...	7,050
	Milwaukee	
	Cincinnati ...	
	Raleigh ...	
	Detroit ...	
	Richmond ...	
	Concord ...	
	Trenton ...	
	Marblehead	
	Memphis ...	
21 32½	Salt Lake City * ...	9,100
	Pensacola *	
32½ 32	Northampton * ...	9,050
	Chester * ...	9,200
32½	Louisville *	9,050
	Chicago * ...	9,300
	Houston * ...	9.050
	Augusta * ...	9,050
	Portland * ...	9,800
32·7	Indianapolis * ...	
	New Orleans *	9,950
	Astoria * ...	
	Minneapolis*	
	Tuscaloosa *	9,975
	San Francisco *	9,950
	Quincy * ...	9,400
	Vincennes *	
	Savannah ...	10,000
	Nashville ...	
	Brooklyn ...	
	Philadelphia	

JAPAN.		
Speed.	Name.	Standard Displacement.
kts.		ons.
33	Nachi * ...	10,000
33	Myoko * ...	
33	Ashigara *...	
33	Haguro * ...	
33	Kako * ...	7,100
33	Furutaka *	
33	Kinugasa *	
33	Aoba * ...	
33	Naka	5,195
33	Sendai ..	
33	Jintzu ...	
33	Nagara ...	5,170
33	Kinu	
33	Abukuma ...	
33	Natori . .	
33	Isudzu ...	
33	Yura	
33	Kuma... ...	5,100
33	Tama	
33	Kitakami ...	
33	Kiso	
33	Oi	
33	Yubari ...	2,890
31	Tenryu ...	3,230
31	Tatsuta ...	
33	Takao * ...	9,850
33	Atago * ...	
33	Chokai * ...	
33	Maya * ...	
	Mogami ...	8,500
	Mikuma ..	
33	Suzuya ...	
33	Kumano ...	8,500
33	*Tone*	
33	*Tikuma* ..	8,450

FRANCE.		
Speed.	Name.	Standard Displacement.
kts.		tons.
33·2	Tourville * ...	10,000
	Duquesne * ...	
32	Suffren *	10,000
33	Duguay-Trouin	
33	La Motte Picquet	7,249
33	Primauguet ...	
34	Emile Bertin ...	5,886
22·8	Colbert *	10,000
32	Foch *	
32	Dupleix	
26	Jeanne d'Arc ...	6,496
31	Algerie *	10, 00
31	La Galissonnière	7,600
	Jean de Vienne	
31	Gloire	
31	Marseillaise ...	
31	Montcalm	
31	*Georges Leygues*	
31		

ITALY.		
Speed.	Name.	Standard Displacement.
kts.		tons.
35	Trento * ...	10,000
35	Trieste *....	
21	Taranto	3,184
28	Quarto	2,900
27½	Bari	3,248
22½	San Giorgio * ...	9,232
27½	Pisa *	8,760
19	F. Ferruccio ...	6,299
37	Alberto da Guissano	5,069
37	Alberico di Barbiano	
37	Bartolomeo Colleoni	
37	Giov. della Bande Nere	
32	Zara *	10,000
32	Fiume *	
32	Gorizia *	10,000
37	Armando Diaz	5,008
37	Luigi Cadorna	
32	Pola *	10,000
36	Bolzano * ...	10,000
37	Attendolo ...	6,941
37	Montecuccoli ...	
36½	E. Filliberto ...	7,283
36·5	E. di Savoia ...	
35	Guiseppe Garibaldi	7,874
35	Duca degli Abruzzi	

SOVIET UNION.		
Speed.	Name.	Normal Displacement.
kts.		tons.
29	Profintern ...	7,200
29½	Chervonaya-Ukrainia	7,600
16	Komintern †	6,675
18	Aurora ...	6,730
29½	Krasni * Kavkas ...	7,600
	Kirov ...	7,600 (e)
	Voroshilov	7,200
35	Mimsk ...	3,000 (e)
35	Lenningrad	
	I	7,600 (e)
	II	
	III	
	IV	
	V	
	VI	
	VII	
	I	3,000 (e)
	II	
	III	
	IV	
	V	
	VI	

GERMANY.		
Speed.	Name.	Standard Displacement.
kts.		tons.
29	Emden ...	5,400
32	Königsberg	6,000
32	Karlsruhe ..	
32	Köln	
32	Leipzig ...	
32	Nürnberg ...	
	*J**	10,000
	(*G*)* Blücher	10,000
	(*H*)* Admiral Hipper	10,000
	"K" ...	10,000
	"L" ...	10,000

(A) Australian Navy. † Under French protection at Bizerta (disarmed). ‡ Listed for disposal. (e) Estimated.

TABLE VI.—CRUISERS (*continued*).

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Normal Displacement.	Speed.	Name.	Displacement.
kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.
25½	Adelaide (A)...	5,100		*Wichita*	10,000															
32¼	Norfolk* ...	9,925		*Phœnix*																
32¼	Dorsetshire* ...	9,975		*Boise*																
32¼	York*	8,250		*Honolulu* ...																
32	Exeter*	8,390		*St. Louis*... ...																
32½	Leander (N.Z.)	7,140		*Helena*																
32½	Achilles (N.Z.)	7,030																		
32½	Neptune ...	7,030																		
	Orion	7,070																		
	Ajax	6,840																		
	Sydney (A) ...	6,830																		
32¼	Arethusa ...	5,220																		
32¼	Galatea	5,220																		
32¼	Amphion ...	7,040																		
32¼	Apollo	6,980																		
32¼	Penelope ...	5,270																		
32¼	Aurora	5,200																		
32	Southampton	9,000																		
	Newcastle ...																			
	Glasgow ...																			
	Sheffield... ...																			
	Birmingham																			
	Liverpool ...	9,300																		
	Manchester ...																			
	Gloucester ...																			
	Belfast	10,000																		
	Edinburgh ...																			
	Dido	5,000																		
	Euryalus ...																			
	Naiad																			
	Phoebe																			
	Sirius																			
	Bonaventure...																			
	Hermione ...																			
	Fiji...																			
	Kenya																			
	Nigeria																			
	Mauritius ...																			
	Trinidad ...																			
		533,650			331,725			240,205			149,729			178,111			127,805			85,400
	† 76 ships, including 17 building.			37 ships, including 8 building.			35 ships, including 2 building.			‡ 18 ships, inlcuding 1 building.			25 ships.			22 ships, including 13 building.			11 ships, including 5 building.	

(A) Australian Navy. (N.Z.) New Zealand Division. † One cruiser minelayer (Adventure, 6,740 tons) in addition. Seven further cruisers are to be laid down in 1937.

‡ To this French cruiser tonnage must be added 32 vessels of an average displacement of 2,432 tons built and building. These vessels are classed in France (as France did not ratify the London Naval Treaty) as contre-torpilleurs; but being of a displacement of over 1,850 tons they automatically fall under the category of cruisers in lists of Fleets compiled by those Powers which ratified that Treaty.

TABLE VII.—AIRCRAFT AND SEAPLANE CARRIERS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.
		tons.			tons.			tons.			tons.			tons.			tons.			
1916	Furious *	22,450	1912	Langley** ...	11,500	1920	Notoro ‡	14,050	1914	Béarn † ...	22,146	1923	Miraglia‡‡	4,960		Krasmi-Moryak	7,600		2 *building*	19,250
1917	Argus ...	14,450	1925	Lexington * ...	33,000	1922	Kamoi ‡	17,000	1929	Commandant Teste ††	10,000									
1917	Pegasus ‖	6,900	1925	Saratoga * ...		1921	Hosho ...	7,470								*Stalin* ...				
1919	Hermes ...	10,850				1925	Akagi *	26,900												
1918	Eagle † *	22,600	1933	Ranger ...	14,500	1921	Kaga †	26,900												
1916	Courageous	22,500				1931	Ryujo	7,100												
1928	Albatross (A)	4,800	1936	*Yorktown* ...	19,900		*Hiryu* ..	10,050												
1916	Glorious *	22,500	1936	*Enterprise* ...			*Soryu* ...													
	Ark Royal	22,600		*Wasp* ...	14,700		*Chitose* ‖	9,000												
	Illustrious						*Chioda* ‖													
	Victorious						*Misud* ‖													
	Formidable																			
	Indomitable																			
	13 ships, including 5 building	240,050		7 ships, including 3 building.	146,500		11 ships, including 5 building	136,470		2 ships.	32,146		1 ship.	4,960		1 ship and 1 building	7,600		2 vessels building	38,500

* Completed as battle-cruisers 1917; converted to aircraft-carriers under the Washington Treaty.

† Designed as battleships

‖ Seaplane carrier, used for experimental work. Not counted as part of the war fleet, under the terms of the London Naval Treaty.

** Converted in 1937 into aircraft tender.

†† Aviation transport, a special type under the terms of London Naval Treaty.

‡ Seaplane carriers converted from oilers.

(A) Seaplane carrier, Australian Navy.

‡‡ Seaplane carrier.

NOTE.—Vessels of which the names are printed in italics are under construction.

BRITISH AND FOREIGN AIRCRAFT TYPES

BRITISH NAVAL AIRCRAFT TYPES.

Fleet Air Arm.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P., Make.	Max. speed, m.p.h.	Ceiling, in feet.
Hawker Nimrod.	Single-seater Fighter. Float or Ship Plane.	480 Rolls-Royce " Kestrel."	192·5	26,900
Hawker Osprey.	Two-seater Fighter. Reconnaissance.	525 Rolls-Royce " Kestrel."	174·5	22,850
Blackburn Shark.	Torpedo Spotter Reconnaissance. Three-seater.	720 Armstrong-Siddeley " Tiger."	150	—
Fairey Swordfish.	Torpedo Spotter Reconnaissance. Three-seater.	700 Bristol " Pegasus."	150	—
Supermarine Walrus.	Fleet Spotter Reconnaissance. Three-seater.	700 Bristol " Pegasus "	123	—
Fairey Seafox.	Light Reconnaissance. Two-seater. Seaplane.	350 Napier Rapier.	117	—
Blackburn Skua.	Fighter. Dive-Bomber.	—	—	—

R.A.F. SHORE-BASED AIRCRAFT WHICH MAY BE EMPLOYED IN CO-OPERATION WITH NAVAL FORCES.*

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling, in feet.
Vickers Vildebeest.	Torpedo-Bomber. Two-seater.	587 Bristol "Pegasus."	141	16,250
Supermarine Scapa.	Reconnaissance Flying Boat. Five-seater.	Two 525 Rolls-Royce "Kestrel."	143	14,950
Short Singapore III.	Reconnaissance Flying Boat. Five-seater.	Four 525 Rolls-Royce "Kestrel."	136	13,600
Saunders-Roe London.	Reconnaissance Flying Boat. Five-seater.	Two 587 Bristol "Pegasus."	135	14,700
Supermarine Stranraer.	Reconnaissance Flying Boat. Six-seater.	Two 870 Bristol "Pegasus" X.	161	18,500
Avro Anson.	General Reconnaissance. Four-seater.	Two 310 "Cheetah" IX.	188	19,500

* Aircraft from the Bomber and Fighter Commands of the Metropolitan Air Force are also occasionally employed in Combined Exercises.

AIRCRAFT ENDURANCE.

Hawker Nimrod, 3¼ hours at 114 m.p.h.; Hawker Osprey, 4¼ hours at 107 m.p.h.; Supermarine Walrus, 4¼ hours at 95 m.p.h.

Short Singapore III, 8¼ hours at 100 m.p.h.; Supermarine Scapa, 10¼ hours at 102 m.p.h.; Saunders-Roe London, 10 hours at 98 m.p.h.; Supermarine Stranraer, 10¼ hours at 98 m.p.h.

FOREIGN NAVAL AIRCRAFT TYPES.

United States Naval Air Service.

Aircraft, Heavier-than-Air.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling (Service), in feet.
Grumman. F2F-1.	Single-seater Fighter. Dive Bomber.	750 "Cyclone."	240	28,000
Grumman. F3F-1.	Single-seater Fighter. Dive Bomber.	750 "Twin-Wasp."	240	28,000
Northrop. BT-1.	Dive Bomber. Crew of 2.	750 "Twin-Wasp."	—	—
Grumman. FF-1.	Two-seater. Fighter.	700 "Cyclone."	222	—
Douglas. P2D-1.	Torpedo Bomber and G.P. Seaplane. Three-seater.	Two 575 "Cyclone."	135	11,950
Douglas. TBD-1.	Torpedo Bomber. Two-seater.	750 "Twin-Wasp."	270	—
Vought. SBU-1.	Two-seater Scout Bomber.	700 "Twin-Wasp."	205	24,600
Vought. SB2U-1.	Two-seater Scout Bomber.	700 "Twin-Wasp."	—	—
Curtiss. SOC-1.	Two-seater Scout. Observation.	550 "Twin-Wasp."	160	—
Consolidated. PBY-1.	Multi-seater. Patrol Flying Boat.	Two 900 "Twin-Wasp."	182	19,300

All engines are air-cooled. " Wasp " engines are made by Pratt and Whitney. " Cyclone " engines are made by Curtiss-Wright.

United States—*continued.*

BASES.

The United States have the following naval flying bases on shore :—

Pensacola, Florida (Training) ;
San Diego, California (Fleet Base and Marines) ;
Hampton Roads, Virginia (Fleet Base) ;
Lakehurst, New Jersey (Lighter-than-air craft) ;
Pearl Harbour, Hawaii (Fleet Base) ;
Coco-Solo, Canal Zone (Fleet Base) ;
Anacostia, D.C. (Experimental) ;
Seattle, Washington (Reserve Training Base) ;
Squantum, Mass. (Reserve Training Base) ;
Floyd Bennet Field, Brooklyn (Reserve Training Base) ;
Philadelphia (Reserve Training Base) ;
Norfolk, Va. (Reserve Training Base) ;
Miami, Fla. (Reserve Training Base) ;
Great Lakes, Ill. (Reserve Training Base) ;
Grosse Ile, Mich. (Reserve Training Base) ;
Minneapolis, Minn. (Reserve Training Base) ;
St. Louis, Mo. (Reserve Training Base) ;
Kansas City, Kansas (Reserve Training Base) ;
Long Beach, Calif. (Reserve Training Base) ;
Oakland, Calif. (Reserve Training Base) ;
Quantice, Va. (Fleet Marine Base) ;
St. Thomas, V.I. (Fleet Marine Base).

AIRCRAFT, LIGHTER-THAN-AIR.

The " Los Angeles " (LZ–126) was built by Zeppelin Co., of Friedrichshafen, and flown across the Atlantic (October, 1924) by a German crew for delivery to the United States. This airship has now been decommissioned. The ZMC–2 was manufactured by the Aircraft Development Corporation, and delivered to the U.S. Navy in September, 1929. She is used at Lakehurst for training.

The " Macon " (ZRS–5), built by the Goodyear Zeppelin Corporation, was delivered to the U.S. Navy in the summer of 1933, and was lost at sea in February, 1935. The " Akron " (ZRS–4), similar to the " Macon," was lost at sea in April, 1933. In addition to the ZMC–2, there are three non-rigid airships, K–1, J–4, and G–1.

Four non-rigid blimps, ranging from 208,000 to 375,000 cubic feet in capacity, have been turned over to the Navy by the Army, as a result of the Army's decision to abandon this type of aircraft. They will be used for training purposes.

A contract for two non-rigid airships has been awarded to the Goodyear Zeppelin Corporation. One of them will have a capacity of 125,000 cubic feet, and will be used for training and general utility purposes. The other, which will be of 400,000 cubic feet capacity, will be used for coastal patrol.

Japanese Naval Air Service.

Type.	Crew.	Engine and H.P.	Weight, lbs.	Speed, m.p.h.
Fighter.				
Navy 95	1	—	—	205
Nakajima 90.	1	Jupiter, 450	2,200	193
Reconnaissance.				
Navy 90–II.	2	Jupiter, 450	3,888	182
Navy 90–III.	3	Jupiter, 450	6,750	—
Navy 94	3	Navy Type 91, 500	5,500	183
Bomber.				
Navy 89	3	Hispano, 650	6,750	144
Navy 92	3	Hiro, 650	6,700	150
Flying Boat.				
Navy 15	4	2 Lorraine, 450	12,815	89
Navy 90–I.	6	3 Hispano, 700	26,400	137
Short 90–II.	6	3 Rolls-Royce, 800	28,600	137

The Hawker " Nimrod " single-seater fighter has been tested and the construction licence purchased from England.

*Lighter-than-air craft are based on Kasumigaura. There is one airship built in Japan in 1929 which is reported to be of 7,000 cubic metres capacity and 250 feet long. They also have two " Blimps."

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* Believed to be in process of being dismantled.

French Naval Air Service.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling, Endurance in hours.
Breguet "Bizerte" Flying Boat.	Long Reconnaissance 5–6	Three 650 "Gnome-Rhone."	130	24,000 10
Breguet "Calcutta" Flying Boat.	Long Reconnaissance 5	Three 450 "Gnome-Rhone."	110	16,000 9
C.A.M.S. 37 Flying Boat.	Short Reconnaissance 3	600 "Hispano."	108	14,760 5
C.A.M.S. 55 Flying Boat.	Long Reconnaissance 3–5	Two 600 "Hispano."	130	14,700 7
L.E.O.-S.A.F. 371 "Dewoitine" Landplane.	Single-seater Fighter (for Aircraft Carrier "Bearn.")	690 "Gnome-Rhone."	236	36,000 2
Gourdou-Lesseure 810 Float Sea-plane.	Spotter Reconnaissance 2	450 "Gnome-Rhone."	120	16,500 5
Latécoère 302 "Croix du Sud" Flying Boat.	Long Reconnaissance 4	Four 650 "Hispano."	130	15,000 10
Latécoère 29 Float Sea-plane.	Torpedo Bomber 3	650 "Hispano."	129	15,500 4
Latécoère 382 Flying Boat.	Long Reconnaissance	Two 650 "Hispano."	125	15,400
L.E.O. 25 Float Sea-plane.	Bomber 4	Two 500 "Hispano."	155	21,000 4½
L.E.O. 43 Float Sea-plane.	Short Reconnaissance 3	650 "Hispano."	138	20,340 3
Levasseur P.L.7 Landplane.	Bomber 2–3 seater (marine type, can alight on water.)	600 "Hispano."	108	14,000 5
Levasseur P.L.15 Float Sea-plane.	Bomber 2	600 "Hispano."	125	14,000 4
Levasseur P.L.101 Avion Marin.	Short Reconnaissance 3	600 "Hispano."	120	16,400 4
Lioré-Nieuport 70 "Loire" Flying Boat.	Long Reconnaissance 5	Three 500 "Hispano."	130	19,864 9

French Naval Air Service—*continued.*

Bases.

The bases and aerodromes of the Naval Air Service are as follows:—

1st Region (Cherbourg)—
  Chantereyne (Sqdns. 1T1 and 1B1, Seaplanes; E2 and 1S1 Flying Boats).

2nd Region (Brest)—
  Lanveoc Poulmic (Sqdns. 2S1, E4 and E6, Flying Boats);
  Brest (Captive Balloons);
  Rochefort (Training);
  Hourtin (Training).

3rd Region (Berre)—
  St. Raphael (Experimental and Sqdn. E5 Flying Boats);
  Berre (Sqdns. 3B1, 3B2, 4T1, Seaplanes, E1 and E3, Flying Boats);
  Hyères (Squadrons 7C2 Landplanes; 3S1, Flying Boats).

4th Region (Bizerta)—
  Karouba (Sqdns. E7, 4S1, Flying Boats); Air Force Loans to Naval Air Service; 4B1, 4B2, 4B3.
  Bizerta (Captive Balloons).

Aircraft, Lighter-than-Air.

Lighter-than-air craft activities received a severe set-back when the "Dixmude" (ex-German L27) was lost with all hands off the coast of Sicily on December 20, 1923. The French Navy is now developing two classes of airship, the "Vedettes" and the "Escorteurs." The "Vedettes," of which there are nine, are of about 125,000 cubic feet capacity, speed of about 40 m.p.h., a crew of four, and endurances varying from 15 to 25 hours. The "Escorteurs," of which there are four, are of about 350,000 cubic feet, have a speed of about 40 m.p.h., a crew of six, and an endurance of about 40 hours.

Italian Naval Air Service.

Maker, Name, Number.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling. Endurance in hours.
Piaggio P6ter. Floatplane.	Two-seater Reconnaissance.	410 " Fiat " A20.	121	11,650 5
Fiat. CR20. Floatplane.	Single-seater Fighter. All metal.	410 " Fiat " A20.	149	18,040 3
Savoia. S55. Monoplane. Flying Boat.	Five-seater Twin Hull Reconnaissance or Bomber.	Two 500 " Isotta Fraschini."	118	9,200 4
Macchi. M18. Flying Boat.	Two-seater Reconnaissance.	200–250 " Isotta Fraschini."	107	12,500 4
Cant 25. Flying Boat.	Single-seater Fighter.	440 " Fiat " A20.	151	18,500 4
M.F.4. Flying Boat.	Three-seater Reconnaissance Monoplane.	610 Stella IX R.	139	16,400 6
Savoia. S78. Flying Boat.	Two-seater Reconnaissance Bomber.	800 "Asso. 750."	152	14,000 (approx.)
Cant. Z501. Flying Boat.	Four-seater Reconnaissance Bomber.	850 "Asso. 750."	149	18,000
Romeo. RO43. Shipplane (Central Float).	Two-seater Reconnaissance.	610 " Piaggio."	194–206	? 6

The wearing of parachutes of the " Salvator " type is compulsory for all occupants of Service Aircraft. Nearly all aircraft carry W/T transmitting and receiving sets, and a few are fitted with R/T. Italy's ship-borne aircraft are chiefly flying boats and are of various types, including the Cant 25, the M.F.4, and the Macchi M.18.

BRITISH AND FOREIGN ORDNANCE TABLES

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

Tables Corrected by the Manufacturers, January, 1938.

NAVAL GUNS AND MOUNTINGS.

		40 mm. 2-pdr.	40 mm. 2-pdr.	40 mm. 2·2-pdr.	47 mm. 3-pdr.	57 mm. 6-pdr.	4-in. 101·6 mm.	4-in. 101·6 mm.	4·7-in. 120 mm.	4·7-in. 120 mm.	5·118-in. 130 mm.	5·5-in. 139·7 mm.	5·906-in. 150 mm.
System		Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore	ins.	1·575	1·575	1·575	1·85	2·244	4	4	4·724	4·724	5·118	5·5	5·906
do. do.	mm.	40	40	40	47	57	101·6	101·6	120	120	130	139·7	150
Length of Bore	cals.	39·37	50	50	50	50	45	50	45	50	52	50	50
Weight of Gun		lb. 590	lb. 655	lb. 1,433	c q. lb. 5 3 14	c. q. 9 1	c. q. 36 0	t. c. q. lb. 2 3 1 14	t. c. 2 19	t. c. q. 3 6 3	t. c. 4 8	t. c. 4 13	t. c. 6 15
do. do.	kg.	268	297	650	298	470	1,830	2,204	3,000	3,391	4,470	4,740	6,858
Weight of Projectile	lb.	2	2	2·2	3·3	6	31	31	48·5	48·5	68	79·37	100
do. do.	kg.	0·91	0·91	1	1·5	2·72	14·06	14·06	22·0	22	30·85	36	45·4
Muzzle Velocity	f.s.	2,000	2,461	2,625	2,800	2,600	2,700	3,000	2,789	3,000	3,000	3,000	2,940
do. do.	m.s.	600	750	800	853	792	823	915	850	915	915	915	896
Muzzle Energy	f.t.	54	84	105	180	280	1,565	1,935	2,616	3,025	4,245	4,953	5,995
do. do.	m.t.	17·0	26	32	55·75	86·7	485	600	810	935	1,315	1,535	1,857
Penetration (W.I. at muzzle).	ins.	..	..	..	6·7	7·5	13·6	16	16·6	18·0	20	22	23
do.	mm.	..	..	..	170	190	345	405	420	460	510	560	585
Rounds per Minute		200	200	130—140	30	28	18	15	12	12	..	..	..
Weight of Mounting and Shield		lb. 1,676	..	lb. 2,128	c. q. lb. 11 1 23	c. q. lb. 17 3 10	t. c. q. 2 18 3	t. c. q. 3 5 1	t. c. q. 4 19 3	t. c. q. 7 15 1	t. c. q. lb. 9 0 1 0	t. c. q. lb. 9 2 0 0	t. c. q. lb. 14 5 3 0
do. do. do.	kg.	760	..	965	582	906	2,985	3,315	5,067	7,887	9,158	9,246	14,517
Weight of Shield		.. ..	.. ..	.. ..	c. q. lb. 1 0 20	c. q. lb. 1 2 10	c. q. lb. 7 2 0	c. q. lb. 14 1 13	c. q. lb. 7 3 0	c. q. lb. 18 3 21	c q. lb. 19 0 0	t. c. q. lb. 1 2 0 0	t. c. q. lb. 3 4 0 0
do. do.	kg.	..	..	..	60	80	380	730	394	962	965	1,118	3,250
Thickness of Shield	ins.	..	..	..	·22	·25	·144	·25	·144	·144	·144	·1875	·625 & ·375
do. do.	mm.	..	..	..	5·6	6·35	3·65	6·35	3·65	3·65	3·65	4·76	16 & 9·5
Angle of Elevation	deg.	85	..	90	20	20	30	30	35	45	45	35	45
Angle of Depression	deg.	5	..	5	20	10	10	10	10	10	10	10	10

The above guns are of all-steel construction.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. NAVAL GUNS AND MOUNTINGS—*continued.*

		6-in. 152 mm.	6-in. 152 mm.	8-in. 203 mm.	8-in. 203 mm.	8-in. 203 mm.	9·2-in. 234 mm.	10-in. 254 mm.	12-in. 305 mm.	13·5-in. 343 mm.	14-in. 356 mm.	15-in. 381 mm.	16-in. 406 mm.
Diameter of Bore	ins.	6	6	8	8	8	9·2	10	12	13·5	14	15	16
do. do.	mm.	152·4	152·4	203·2	203·2	203·2	233·7	254	304·8	342·9	355·6	381	406·2
Length of Bore	cals.	45	50	45	50	55	50	50	50	45	50	45	45
		t. c.	t. c. q.	t. c.	t. c.	t. c.	t. c. q.	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.
Weight of Gun		6 10	6 17 2	14 0	15 14	16 10	28 16 2	26 1	43 10	66 0	80 0	87 0	105 0
do. do.	kg.	6,605	6,985	14,225	15,940	16,765	29,290	26,470	44,200	67,060	81,284	88,400	106,685
Weight of Projectile	lb.	100	100	250	256	256	380	500	850	1,400	1,560	1,951	2,000
do. do.	kg.	45·36	45·4	113·4	116·0	116·0	172·37	226·8	385·6	635	707·6	885	907·2
Muzzle Velocity	f.s.	2,850	3,000	2,845	3,000	3,150	3,000	2,933	2,933	2,500	2,475	2,500	2,650
do. do.	m.s.	869	915	867	914	960	914	894	894	762	754	760	808
Muzzle Energy	f.t.	5,630	6,240	14,030	15,976	17,615	23,714	29,825	50,705	60,675	66,260	84,550	97,390
do. do.	m.t.	1,745	1,930	4,345	4,950	5,445	7,340	9,235	15,705	18,790	20,520	26,185	30,160
Penetration (W.I. at muzzle)	ins.	22	24	31	34·5	38	38·8	41·7	50·3	51·5	51·65	55	59
do.	mm.	560	610	785	875	965	985	1,060	1,280	1,310	1,310	1,400	1,500
Rounds per Minute		10	..	5	6	6	4	3	2	1·5	1·5	..	1·2
		t. c. q.	t. c. q. lb.	t. c.	t. c.	t. c.	t.	t.	t.	t.	t.	t.	t.
Weight of Mounting and Shield		12 9 2	12 1 0 0	144 10	147 10	149 10	257	287	431	558	588	844	1,270
do. do. do.	kg.	12,675	12,245	146,800	150,000	152,000	261,100	291,600	438,000	567,000	597,500	857,500	1,290,000
		t. c. q. lb.	t. c. q. lb	t.	t.	t.	t.	t.	t.	t.	t.	t.	t.
Weight of Shield		4 4 3 16	3 4 0 0	24	24	24	102	115	150	192	191	315	670
do. do.	kg.	4,315	3,250	24,400	24,400	24,400	103,600	117,000	153,400	195,100	194,000	320,000	680,700
Thickness of Shield	ins.	1·5 & 1	·625 & ·375	1 & ·75	1 & ·75	1 & ·75	8, 7, 3 & 2	6, 4 & 1·5	13, 11 & 3	11, 4 & 3	10, 9 & 3	15, 12, 11 & 5	15, 11, 8, 4 & 3
do. do.	mm.	38 & 25·4	16 & 9·5	25 & 20	25 & 20	25 & 20	203, 178, 75 & 50	152, 102, & 38	330, 280, & 75	280, 102, & 75	254, 230, & 75	381, 305, 280, 127	381, 280, 203, 102 & 75
Angle of Elevation	deg.	30	35	70	70	70	15	40	15	20	25	30	40
Angle of Depression	deg.	5	10	3	3	3	5	5	5	5	5	5	5

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured for some of the above having approximately the same characteristics.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. HOWITZERS AND FIELD GUNS.

		2·953-in. 75 mm. Field.	2·953-in. 75 mm. Field.	4·134-in. 105 mm. Field Howr.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	5-in. 127 mm. Field.	6-in. 152 mm. Howr. On 105 mm. Carriage.	6-in. 152 mm. Field.	8-in. 203 mm. Railway.	8·268-in. 210 mm. Semi-Mobile.	12-in. 305 mm. Railway.	15-in. 381 mm. Railway.
Diameter of Bore	ins.	2·953	2·953	4·134	4·134	4·134	4·134	4·134	5	6	6	8	8·268	12	15
do. do.	mm.	75	75	105	105	105	105	105	127	152	152	203	210	305	381
Length of Bore	cals.	30	40	21	26	35	45	50	41	20	45	50	40	50	45
		c. q.	c. q.	c. q.	c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c.	t. c.	t. c.	t. c.
Weight of Gun		7 3	11 3	11 2	12 0	1 5 0	1 13 0	1 14 0	2 11 2	1 6 2	5 12 1	15 5	10 19	43 10	87 0
do. do.	kg.	394	597	584	610	1,270	1,675	1,725	2,615	1,346	5,700	15,500	11,125	44,200	88,400
Weight of Projectile . . .	lb.	14·33	14·33	26·45	33·07	35·27	35·27	35·27	56	90·17	100	256	286·6	850	1,951
do. do. . . .	kg.	6·5	6·5	12·0	15·0	16	16·0	16	25·5	40·9	45·4	116	130	385·6	885
Muzzle Velocity	f.s.	1,952	2,461	1,608	2,000	2,543	2,690	2,953	2,700	1,591	2,870	2,900	2,608	2,933	2,500
do. do.	m.s.	595	750	490	610	775	820	800	823	485	875	884	795	894	760
Muzzle Energy	f.t.	379	602	474	915	1,580	1,770	2,133	2,830	1,583	5,730	14,930	13,515	50,705	84,550
do. do.	m.t.	117	186	147	284	490	548	659	877	490	1,774	4,625	4,185	15,705	26,185
Rounds per Minute		25	..	10	10	10	..	10	..	..	4	4	3	5 in 2 mins.	2
		t. c. q. lb.	t. c.	c. q. lb.	t. c. q. lb.	t. c. q.	t. c.	t. c. q.		t. c. q.	t. c. q. lb.	t. c.	tons	tons	tons
Weight of Mounting and Shield .		1 1 1 25	1 4	19 1 16	1 9 2 0	2 7 0	2 19	2 16 0	..	2 11 3	7 13 3 20	62 8	28	175	275
do. do. do.	kg.	1,091	1,219	985	1,498	2,388	2,997	2,842	..	2,629	7,820	63,400	28,450	177,800	279,400
		c. q. lb.		c. q. lb.	c. q. lb.										
Weight of Shield		1 2 10	..	1 2 24	0 3 0	NoShield	NoShield	NoShield	..	No Shield	No Shield	No Shield	No Shield	No Shield	No Shield
do. do.	kg.	80·7	..	87	38	..	..	..	..	..	..	..	..	..	..
Thickness of Shield	ins.	·16	..	·125	·16	..	..	..	..	..	..	..	..	..	..
do. do.	mm.	4	..	3·2	4·06	..	..	..	..	..	..	..	..	..	..
Angle of Elevation	deg.	40	45	40	45	45	45	45	..	45	45	50	50	35½	40
Angle of Depression . . .	deg.	5	8	5	5	5	0	5	..	5	5	0	2	0	0

		TANK GUNS.			FOR VICKERS CARDEN LOYD VEHICLE.	MOUNTAIN HOWITZERS.		LANDING GUN.
		57 mm. 6-pdr. Semi-Auto.	47 mm. 3-pdr. Semi-Auto.	40 mm. 2-pdr. Semi-Auto.	47 mm. 3-pdr.	2·953-in. (75 mm.) Jointed.	4·134-in. (105 mm.) Jointed.	2·953-in. (75 mm.) Jointed.
Diameter of Bore	ins.	2·244	1·85	1·575	1·85	2·953	4·134	2·953
do. do.	mm.	57	47	40	47	75	105	75
Length of Bore	cals.	27	35	50	21	18	11	18
		c. q. lb.	c. q. lb.	c. q. lb.	lb.	c. q. lb.	c. q. lb.	c. q. lb.
Weight of Gun		2 2 14	2 2 0	2 0 13	165	3 2 4	5 0 0	3 2 4
do. do.	kg.	133	127	108	74·8	179·8	254	179·8
Weight of Projectile	lb.	6	3·3	2	3·3	14·33	26·45	14·33
do. do.	kg.	2·72	1·5	·91	1·5	6·5	12	6·5
					A.P. Shell. H.E. Shell.			
Muzzle Velocity	f.s.	1,200	1,854	2,600	1,600 984	1,450	1,148	1,450
do. do.	m.s.	366	565	792	488 300	442	350	442
Muzzle Energy	f.t.	60	79	93·7	58·6 22·2	210	242	210
do. do.	m.t.	18·6	24·5	29	18·1 6·9	65·0	74·5	65·0
Rounds per Minute		..	..	..		18	10	..
		c. q. lb.	c. q. lb.	c. q. lb.		c. q. lb.	c. q. lb.	c. q. lb.
Weight of Mounting and Shield .		2 3 21	2 2 0	2 1 14		9 1 14	12 1 0	11 0 0
do. do. do.	kg.	149	127	120·65		476	622	559
				lb.		c. q. lb.	c. q. lb.	c. q. lb.
Weight of Shield		..	..	15·25		1 1 0	1 3 6	1 1 5
do. do.	kg.	..	..	6·92		63·5	92	65·75
Thickness of Shield	ins.	..	..	·4		·144	·16	·16
do. do.	mm.	..	..	10		3·6	4·0	4·0
Angle of Elevation	deg.	30	30	20		45	45	45
Angle of Depression	deg.	10	10	10		10	5	5

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. INFANTRY GUNS.

		44–60 mm.			47 mm.			65 mm.			70 mm. with 25·4 mm. S.C. Tube, on Platform Carriage.	
		44 mm. Barrel.		60 mm. Barrel.	Armour-Piercing Ammunition.		High-Explosive Ammunition.		High Explosive Ammunition.		70 mm. Barrel.	25·4 mm. S.C. Tube.
Diameter of Bore	ins.	1·73		2·36		1·85			2·559		2·756	1·0
do. do.	mm.	44		60		47			65		70	25·4
Length of Bore	cals.	30		20		21			16		15	50
		Barrel.	Breech Ring.	Breech Mechanism.	Barrel.	Breech Ring.	Breech Mechanism.	Barrel.	Breech Ring.	Breech Mechanism.	Gun and Mechanism.	S.C. Tube.
Weight of Gun		75 lb.	50 lb.	26 lb.	75 lb.	68 lb.	28 lb.	88 lb.	62 lb.	38 lb.	172 lb.	56·5 lb.
do. do.	kg.	34	22·7	11·8	34	30·8	12·7	38	28	17	78	25·6
Weight of Projectile . . .	lb.	2·75		5·5	3·3		3·3		8·8		8·8	0·55
do. do.	kg.	1·25		2·5	1·5		1·5		4		4	0·25
Muzzle Velocity	f.s.	1,706		732	1,600		755		820		700	2461
do. do.	m.s.	520		223	488		230		250		213	750
Muzzle Energy	f.t.	55·5		20·4	58·6		13·0		41·0		30	23·1
do. do.	m.t.	17·2		6·3	18		4		12·7		9·3	7·15
Weight of Mounting and Shield	lb.		343			397			582		558 with Platform	
do. do. do.	kg.		156			180			264		253 ,, ,,	
Weight of Shield	lb.		—			45			106			
do. do.	kg.		..			20·4			48			
Thickness of Shield . . .	ins.		..			0·14			0·16			
do. do.	mm.		..			3·5			4			
		44 mm. Barrel.		60 mm. Barrel.	Low Position.		High Position.	Low Position.		High Position.		
Angle of Elevation . . .	deg.	10		20 to 60	15		45	17		45	45	15 Nominal
Angle of Depression . . .	deg.	5		0	10		2½	10		2	10	10

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. GUNS MOUNTED ON AIRCRAFT.

		* ·303-in. (7·7 mm.) for aircraft gun.	*·303-in. (7·7 mm.) Observer's gun.	*·303-in. (7·7 mm.) Pilot's gun.	·5-in. (12·7 mm.) Observer's gun.	·5-in. (12·7 mm.) Pilot's gun.	·5-in. (12·7 mm.) Observer's Gun.	1·457-in. (37 mm.) Observer's gun.	1·575-in. (40 mm.) Observer's gun.
System		Vickers-Armstrongs Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Recoil operated.	Vickers Semi-Auto. operated.
Diameter of Bore . .	ins.	·303	·303	·303	·5	·5	·5	1·457	1·575
do. do. . .	mm.	7·7	7·7	7·7	12·7	12·7	12·7	37	40
Length of Bore . .	cals.	72	79·2	93·7	50	62·2	72	39·5	40
Weight of Gun . .	lb.	20·5	25	26·5	45	52·5	70	200	234
do. do. . .	kg.	9·3	11·3	12	20·4	23·8	32	90·72	106
Weight of projectile .	lb.	174 grs.	174 grs.	174 grs.	565 grs.	565 grs.	690 grs.	1·47	2
do. do. .	kg.	11·3 grms.	11·3 grms.	11·3 grms.	36·6 grms.	36·6 grms.	44·7 grms.	0·666	0·91
Muzzle Velocity . .	f.s.	2,400	2,400	2,440	2,450	2,550	2,800	1950	2,300
do. do. . .	m.s.	732	732	744	746	777	853	594	700
Muzzle Energy . .	f.t.	0·9	0·9	1	3·36	3·64	5·36	38·72	73
do. do. . .	m.t.	0·28	0·28	0·31	1·04	1·125	1·66	11·98	22·6
Rounds per Minute . . .		900–1000	650–750	900–1000	450–650	450–650	400–450	100	..
Weight of Mounting .	lb.	5	..	..	..	..	..	102	432
do. do. .	kg.	2·3	..	..	..	..	..	46	196
Angle of Elevation .	deg.	90	..	..	..	..	..	55	60
Angle of Depression .	deg.	90	..	..	..	..	..	40	30

MACHINE GUNS—ANTI-AIRCRAFT.

		*·303-in. (7·7 mm.)	*·303-in. (7·7 mm.)	·5-in. (12·7 mm.)	·5-in. (12·7 mm.)	·5-in. (12·7 mm.)
System		Vickers Recoil operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.
Diameter of Bore	ins.	·303	·303	·5	·5	·5
do. do.	mm.	7·7	7·7	12·7	12·7	12·7
Length of Bore	cals.	93·7	72	62·2	90	72
Weight of Gun	lb.	32	22	52·5	101	70
do. do.	kg.	14·5	10	23·8	40·6	32
Weight of Projectile . .	lb.	174 grs.	174 grs.	565 grs.	690 grs.	690 grs.
do. do.	kg.	11·3 grms.	11·3 grms.	36·6 grms.	44·7 grms.	44·7 grms.
Muzzle Velocity . . .	f.s.	2,440	2,400	2,550	3,000	2,800
do. do.	m.s.	744	732	777	914	853
Muzzle Energy	f.t.	1	0·9	3·64	6·15	5·36
do. do.	m.t.	·31	0·28	1·125	1·9	1·66
Rounds per minute		500–600	450–500	450–650	350–450	400–450

* This gun can be adapted to fire any pattern of rifle calibre ammunition.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. ANTI-AIRCRAFT GUNS.

		40 mm. 2-pdr.	40 mm. 2-pdr.	40 mm. 2·2-pdr.	40 mm. 2·2-pdr.	47 mm. 3-pdr.	Mobile 75 mm. 40 Calibre	Mobile 75 mm. 46 Calibre	3-inch	4-in.	4-in.	105 mm. 45 Calibre	4·7-in.
System		Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Construction		Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Diameter of bore	ins.	1·575	1·575	1·575	1·575	1·85	2·953	2·953	3	4	4	4·134	4·724
,, ,,	mm.	40	40	40	40	47	75	75	76·2	101·6	101·6	105	120
Length of bore	cals.	39·37	50	50	50	50	40	46	50	45	50	45	40
Weight of gun		lb. 590	lb. 655	lb. 1,433	c. q. lb. 2 0 17	c. q. lb. 5 3 14	c. q. lb. 11 0 0	c. q. lb. 13 0 12	t. c. q. 1 3 1	t. c. q. 1 16 1	t. c. q. lb. 2 3 1 14	t. c. q. 2 1 2	t. c. q. 3 1 0
,, ,,	kg.	268	297	650	109	298	560	666	1181	1842	2204	2,110	3,100
Weight of projectile	lb.	2	2	2·205	2·205	3·3	14·33	14·33	14·33	31	31	35·274	48·5
,, ,,	kg.	·91	·91	1	1	1·5	6·5	6·5	6·5	14·06	14·06	16	22
Muzzle velocity	f.s.	2,000	2,461	2,625	2,625	2,800	2,461	2,641	2,560	2,700	3,000	2,625	2,560
,, ,,	m.s.	600	750	800	800	853	750	805	780	823	915	800	780
Muzzle energy	f.t.	54	84	105	105	180	602	695	650	1,565	1,935	1,685	2,205
,, ,,	m.t.	17	26	32	32	55·75	186	215	201	485	599	522	683
Rounds per minute		200	200	130–140	35	30	..	..	25	18	18	..	12
Weight of mounting (exclusive of Gun)		c. q. lb. 14 3 24	..	c. q. lb. 19 0 0	c. q. 12 3	c. q. lb. 18 2 3	t. c. q. lb. 2 5 2 23	t. c. q. lb. 2 5 2 18	t. c. q. 2 18 2	t. c. q. lb. 6 14 0 18	t. c. q. lb. 10 5 1 0	t. c. q. 5 18 2	t. c. q. lb. 9 0 1 0
,, ,,	kg.	760	..	965	647·6	941·1	2,322	2,320	2,971	6815	10,427	6,020	9157·1
Angle of elevation	deg.	85	..	90	90	80	90	90	90	90	90	90	90
Angle of depression	deg.	5	..	5	0	5	0	0	5	5	5	5	5

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. MACHINE AND AUTOMATIC GUNS.

		*·303-in. (7·7-mm.) Observer's Gun for Aircraft.	*·303-in. (7·7-mm.) Pilot's Gun for Aircraft.	*·303-in. (7·7-mm.) Land and Naval.	*·303-in. (7·7-mm.) Gun for Aircraft.	*·303-in. (7·7-mm.) for Infantry.	·5-in. (12·7-mm.) Observer's Gun for Aircraft.	·5-in. (12·7-mm.) Pilot's Gun for Aircraft.	·5-in. (12·7-mm.) Land and Naval.	·5-in. (12·7-mm.) Land and Naval.	·5-in. (12·7-mm.) Observer's Gun for Aircraft.	·5-in. (12·7-mm.) for Anti-Aircraft and Anti-Tank.	1·457-in. (37-mm.) Observer's Gun for Aircraft.	1·575-in. (40-mm.) 2-pr. Anti-Aircraft.	1·575-in. (40-mm.) 2-pr. Auto.	1·575-in. (40-mm.) 2·2-pr. Anti-Aircraft.
System.		Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.
Diameter of Bore .	ins.	·303	·303	·303	·303	·303	·5	·5	·5	·5	·5	·5	1·457	1·575	1·575	1·575
do. do. .	mm.	7·7	7·7	7·7	7·7	7·7	12·7	12·7	12·7	12·7	12·7	12·7	37	40	40	40
Length of Bore . .	cals.	79·2	93·7	93·7	72	72	50	62·2	62·2	90	72	72	39·5	39·37	50	50
Weight of Gun . .	lb.	25	26·5	32	20·5	22	45	52·5	52·5	101	70	70	200	590	655	1,433
do. do. . .	kg.	11·3	12	14·5	9·3	10	20·4	23·8	23·8	40·6	32	32	90·72	268	297	650
Weight of Projectile .	grs.	174	174	174	174	174	565	565	565	690	690	690	1·47 lb.	2 lb.	2 lb.	2·2 lb.
do. do. .	grms.	11·3	11·3	11·3	11·3	11·3	36·6	36·6	36·6	44·7	44·7	44·7	0·666 kg.	·91 kg.	·91 kg.	1 kg.
Muzzle Velocity . .	f.s.	2,400	2,440	2,440	2,400	2,400	2,450	2,550	2,550	3,000	2,800	2,800	1950	2,000	2,461	2625
do. do. . .	m.s.	732	744	744	732	732	746	777	777	914	853	853	594	600	750	800
Muzzle energy . .	f.t.	0·9	1	1	0·9	0·9	3·36	3·64	3·64	6·15	5·36	5·36	38·72	54	84	105
do. do. . .	m.t.	0·28	0·31	0·31	0·28	0·28	1·04	1·125	1·125	1·9	1·66	1·66	11·98	17	26	32
Rounds per minute . . .		650–750	900–1000	500–600	900–1000	450–500	450–650	450–650	450–650	350–450	400–450	400–450	100	200	200	130–140
Weight of Mounting .	. lb.	..	..	..	5	..	..	..	..	..	..	..	102	1,676	..	2,128
do. do. .	. kg.	..	..	..	2·3	..	..	..	..	..	..	..	46	760	..	965
Angle of Elevation . . .		..	..	..	90°	..	..	..	..	..	..	..	55°	85°	..	90°
Angle of Depression . . .		..	..	..	90°	..	..	..	..	..	..	..	40°	5°	..	5°

* This gun can be adapted to fire any pattern of rifle calibre cartridge.

BEARDMORE GUNS AND HOWITZERS.

		NAVAL.																	
Calibre	ins.	4	4	4·7	4·7	4·7	5·5	5·5	5·5	6·0	6·0	7·5	8	8	9·2	12	13·5	15	16
do.	mm.	101·6	101·6	120	120	120	140	140	140	152	152	190	203·2	203·2	234	305	343	381	406
Length of Bore	cals.	50	55	50	45	52·5	55	55	40	50	52·5	45	50	55	50	50	46	45	45
Weight of Gun	tons	2·15	2·45	3·65	3·35	3·85	8·0	6·8	5·35	7·95	8·1	13·9	17·5	19·25	29	66	77	96	107
do. do.	kg.	2,184	2,489	3,711	3,405	3,911	8,128	6,910	5,435	8,077	8,230	14,122	17,780	18,542	24,402	67,056	78,232	97,536	108,712
Weight of Projectile	lbs.	31	31	50	50	48·5	92·6	82	75	100	100	200	250	250	425	950	1,350	1,850	2,100
do. do.	kg.	14·06	14·06	22·68	22·68	22	42	37·2	34	45·36	45·36	90·72	114·2	114·2	192·8	430·9	612·4	839·2	952·5
Muzzle Velocity	f.s.	2,920	3,000	2,950	2,650	3,000	2,950	3,000	2,650	2,970	3,000	2,750	2,900	3,000	2,825	2,825	2,650	2,620	2,675
do. do.	m.s.	890	914	900	808	914·4	900	914·4	808	905·2	914·4	838	884	914	861	861	808	799	815
Muzzle Energy	f.t.	1,833	1,935	3,017	2,434	3,026	5,587	5,117	3,652	6,116	6,240	10,488	14,579	15,602	23,518	52,571	63,738	88,056	104,198
do. do.	m.t.	568	599	934	837	937	1,730	1,584	1,131	1,894	1,938	3,248	4,515	4,832	7,283	16,280	20,441	27,270	32,270

		Motor Boats or Sub-marines.	Sub-marine.	ANTI-AIRCRAFT.							TANK GUNS.	
				For Sub-marines.	Fixed.	Fixed.	Fixed.	Fixed.	Mobile.			
Calibre	ins.	3·0	4·0	3·0	3·0	4·0	4·0	4·724	3·02	3·3	1·85	2·24
do.	mm.	75	101·6	75	75	101·6	101·6	120	77	84	47	57
Length of Bore	cals.	45	40	45	45	45	50	40	47·5	42·5	30·0	23
Weight of Gun	ton	0·67	1·3	0·64	1·65	1·95	2·1	3·1	0·75	1·1	1·8 cwt.	5·6 cwt.
do. do.	kg.	686	1,321	648	1,675	1,981	2,133	3,150	762	1,120	90·7	284
Weight of Projectile	lbs.	12·5	31	16	16	31	31	48·5	17·6	21	3·25	6
do. do.	kg.	5·67	14·06	7·26	7·26	14·06	14·06	22	8·0	9·53	1·49	2·72
Muzzle Velocity	f.s.	2,200	2,250	2,100	2,590	2,600	2,850	2,560	2,175	2,300	1,750	1,525
do. do.	m.s.	670	685·8	640	790	792	869	780	663	701	533	465
Muzzle Energy	f.t.	419	1,088	489	744	1,453	1,740	2,205	577	770	69	96·7
do. do.	m.t.	130	337	151	230	450	530	672	179	238	21·6	30
				Semi-Auto.								

		ANTI-TANK.			FIELD GUNS AND HOWITZERS.									
		Infantry Guns.			Gun.	How.	How.	How.	How.	Gun.	How.	How.	Mountain H.	
Calibre I	ins.	1·85	1·575	2·24	3·3	4·134	3·3	4·5	6	6	8	9·2	3·3	
do.	mm.	47	40	57	84	105	84	112	152·4	152·4	203·2	234	84	
Length of Bore	cals.	28·5	37	24	31	20	15	20	13	35	17	17	12·25	
		cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.	tons	tons	tons	tons	wts.	
Weight of Gun		1·03	0·92	0·92	7·25	8·0	4·28	9	1·15	3·7	3·0	4·25	4·0	
do. do.	kg.	52·4	46·7	46·7	369	406	194	458	1,168	3,759	3,048	4,318	203	
Weight of Projectile	lbs.	3·25	2·0	6·0	18·5	35·2	18·5	35		100	200	290	18·5	21·0
do. do.	kg.	1·49	0·91	2·72	8·39	16	8·39	15·88	45·36	45·36	90·72	131·5	8·39	9·53
Muzzle Velocity	f.s.	1,550	2,000	700	1,820	1,350	1,100	1,100	1,250	2,375	1,500	1,500	1,040	960
do. do.	m.s.	473	609·6	213·4	555	412	335	335·3	381	724	457	457	317	290
Muzzle Energy	f.t.	54	55	20·4	425	444	155	293·6	1,083	3,911	3,120	4,524	138	134
do. do.	m.t.	16·7	17	6·3	131	138	48	90·9	335	1,211	956	1,401	42·7	41·5
		S.A.	S.A.	S.A.										
			In same carriage.							In same carriage.				

BRAZIL NAVAL ORDNANCE.

Calibre in Centimetres. Length in Calibres.	Model and Maker.	Year of Construction.	Weight of gun in kilograms.	Projectile.			Carried by.
				Weight of Projectile in kilograms.	Velocity in metres per second.	Muzzle energy in Tons.	
305 m/m. 45	Model I, Armstrong	1908	61·947	385,500	853	—	M. Geraes and S. Paulo.
152 m/m. C/50	Model II ,,	1897	7,722	45,360	793	1454	Paraguassú (Parnahyba).
120 m/m. 40	Model II, ,,	1898	2·794	20,040	793	—	Pernambuco and Belmonte.
120 m/m. 50	Model III ,,	1908	3·369	20,400	915	—	Minas, S. Paulo, Bahia and Rio Grande do Sul.
120 m/m. 41	Model Ansaldo	—	—	—	—	—	Humayta.
101,6 m/m. 40	Model II, Armstrong	1908	1,321	14,000	701	—	Piauhy, R.G. Norte, Parahyba, Alagôas, Sergipe, S. Catharina and Matto-Grosso.
101,6 m/m. 40	Model III, Armstrong	1922	1,339	14,000	701	352	Maranhão and Ceará.
101,6 m/m.	Model, N. Vickers-Armstrong	1934	—	14,061	853	—	Almirante Saldanha.
87 m/m. 8	Armstrong	1898	109	6,800	289	—	Oyapock, Parnahyba and Paraguassú.
76 m/m. 50	Model I, Bethlem	1918	—	5,900	823	—	Minas and São Paulo.
76,2 m/m. A.A.	Vickers-Armstrong, Model I	1934	—	5,56	620	—	Almirante Saldanha.
76,2 m/m. T.R.S.A.	,, ,, ,,	1934	—	5,56	780	—	Almirante Saldanha.
57 m/m. 40	Model I, Hotchkiss	1898	365	2,700	553	42·4	Ceará.
47 m/m. 40	,, ,,	1898	220	1,500	610	28·5	Pernambuco, J. Bonifacio, Salles de Carvalho and Oyapock.
47 m/m. 50 S.A.	Model I, Armstrong	1908	259	1,500	701	—	Piauhy, R. G. Norte, Parahyba, Alagôas, Sergipe, S. Catharina and Matto-Grosso.
47 m/m. 50 S.A.	Model II, Armstrong	1908	371	1,500	817	—	Minas and São Paulo. Bahia, R. G. Sul and Maranhão.
47 m/m. 46 S.A.	Model III ,,	1908	371	1,500	817	—	Ceará.
47 m/m. 45	Model I, Nordenfeldt	1898	233·4	1,497	585	—	Oyapock, Parnahyba and Paraguassú.
38 m/m. 41	,, ,,	1898	—	0·810	—	—	M. Couto, M. Alves, and Lahmeyer.
37 m/m. 42	Model I, Hotchkiss	1898	120	0·850	600	15·5	Pernambuco and Oyapock.
37 m/m. 30	,, M. Nordenfeldt	1898	189	0·453	549	—	Oyapock, Pernambuco and Voluntario.

This Table has been supplied through the courtesy of Captain Natal Arnaud, in London.

FRENCH NAVAL ORDNANCE.

August, 1936.

Calibres (mm.) . . .	340	330	305	203	155	152	138			130		100	90	75	37
Model	1912	—	1906–10	1924	1920	1930	1929	1923	1910	1924	1919	1917	1926	1924	1925
Length (in calibres) . .	45	—	45	50	50	55	—	40	55	40	40	45	50	50	50
Weight of gun (Kgs.) .	66,280	—	54,020	20,716	8,530	8,000	—	4,113	5,300	3,875	4,392	1,565	1,600	1,095	158
Weight of projectile . .	554	—	432	123	560	54	—	40	39	32	32	14	9·5	6	0·75
Weight of charge (Kgs.)	151	—	126	47	19·6	17	—	9	11	8	8	4	3	2	0·25
Pressure (kg/cm²) . .	2,800	—	2,400	2,750	3,050	3,200	—	2,500	2,500	2,420	2,420	2,300	3,200	2,560	2,400
Muzzle velocity (m/sec.).	794	—	783	850	850	870	—	700	830	734	734	720	850	850	850

GERMAN NAVAL ORDNANCE.

Calibre.	Usual Naval Designation.	Length in Cals.	Date of Model.	Weight of Gun.	Weight of A.P. Shot.	Initial Velocity.	Maximum penetration direct impact against K.C. at			Danger space against average ships at			Approximate Muzzle Energy.
							9,000 yards.	6,000 yards.	3,000 yards.	10,000	5,000	3,000	
inch	c/m			tons	lbs.	foot-secs.	inches	inches	inches	yards	yards	yards	foot-tons
11	28	..	'28	..	670	..	..	..	..	..	..	..	..
11	28	40	'01	32·2	661·4	2756	6	10	14	150	450	740	31,600
6·7	17	40	'01	7·5	154·5	2756	..	3	5	80	240	460	8,275
5·9	15	50	..	5·5	101·4	3084	..	..	..	..	..	..	6,690
5·9	15	45	'09	5		2920	..	..	5	..	200	420	5,990
4·1	10·5	45	'16	..	38·2	..	..	..	..	..	..	..	..

Brass cartridge cases to all guns.

Lesser guns: 3·4 inch (88 m/m) firing 22 lb. projectiles in modern and 15 lb. in old models.

A.A. guns: 6 inch, 4·1 inch, 3·4 inch War Marks on H.A. mounts ("Flak").

Projectiles: Guns of 11 inch and over fire A.P., Ersatz A.P., H.E., and common shell.

The 1899 and later models have the recoil utilized to return the gun to firing position for pieces over 6 inch. In 6 in., springs are employed. German guns have a lower muzzle pressure than normally obtains.

11 inch, 40 cal., M. '01 in Deutschland and Braunschweig classes.

ITALIAN NAVAL ORDNANCE.

Official Designation:— Calibre mm., length cal.	305/46	254/45	254/45	203/53	203/50	190/45	152/53	152/50	152/45	120/50	120/50	120/45	102/45	100/47	102/35	76/50	76/45	76/40	76/17
Mark A. = Armstrong, V = Vickers, An. = Ansaldo. S. = Schneider.	A., V.	A.	V.	An.	S.-An.	A., V.	An.	A.	S.	An. 1926	A., V.	A. 1918	S. A.		S.	A., V.	S.	A.	S.
Mark O.T.O. = Odero-Terni-Orlando							O.T.O.			O.T.O.		O.T.O.		O.T.O.					
Date of introduction.	1909	1907	1906	1929	1924	1906	1927–29	1918	1911	1931	1909	1928–1931	1917	1929	1914–1915	1909	1911	1916	1912
Designation by calibre, cm.	30·479	25·4	25·4	20·3	20·3	19·05	15·24	15·24	15·24	12·0	12·0	12·0	10·2	10·0	10·2	7·62	7·62	7·62	7·62
Calibre in inches	12	10	10	8	8	7·5	6	6	6	4·75	4·75	4·75	4	3·9	4	3	3	3	3
Lengths Total, in feet	47·77	39·07	38·715	36·646	34·593	29·22	27·83	25·94	23·42	19·57	20·38	18·38	15·715	15·721	12·247	13·271	11·722	10·292	4·593
Rifled Bore, in inches	477·9	358·4	370·5	358·66	—	281·7	—	256·6	219·2	—	204·64	174·64	150·74	12·365	114·29	126	107·2	101·57	44·8
Powder Chamber in inches	97·7	74·91	74·91	64·56	—	51·65	—	44·6	44·6	—	28·64	35·03	27·16	3·112	23·50	22	25·4	—	—
Bore in calibres	37·3	35·84	37·05	—	—	37·5	—	42·77	36·54	—	43·31	36·96	37·53	15·371	28·46	42	35·73	28·42	14·96
No. of Grooves	72	60	70	52	52	44	44	36	56	36	36	36	40	26	32	28	25–8	16	24
Twist of Rifling, in calibres	30	30	00–30	—	30	00–30	30	33	36	30	30	30	—	30	—	30	35·9	33	22
Total Weight in tons	62·99	34·49	35·339	19·170	20·800	14·478	7·700	8·100	7·025	3·00	3·662	4·035	2·327	2·020	1·200	1·122	0·698	0·660	0·104
Firing Charge Armour-piercing projectile lb.	346	185	185	111·994	103·19	70·987	43	—	—	—	—	—	—	—	—	—	—	—	—
Common Shell, H.E., lb.	279·9	185	185	—	—	70·987	—	32·79	30·64	—	14·66	9·589	9·479	10·319	6·50	3·02	3·571	2·281	0·529
Weight Armour-piercing projectile lb.	997·2	494	494	275·573	260	200·39	103·5	—	—	50·5	—	—	—	—	—	—	—	—	—
Shell, H.E., lb.	884·4	489·8	489·8	—	—	498·5	—	110·22	103·61	—	48·74	48·74	30·31	30·318	30·31	14·05	14·05	13·954	11·68
Shrapnel, lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11·68
Bursting Charge. Armour-piercing projectile lb.	16·63	4·37	4·37	—	—	2·332	—	—	—	—	—	—	—	—	—	—	—	—	—
Shell, H.E. lb.	53·13	29·86	29·86	—	—	11·706	—	5·996	7·528	—	2·711	2·711	2·866	—	2·866	1·102	1·102	—	0·782
Shrapnel, lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·165
Muzzle Velocity in ft. secs.	2755·9	2788·77	2788·77	3051·180	2743·20	2788·77	2786	2854	2723	2786	2788	2460	2788	2438·40	2460	2460	2460	2214	1230
Muzzle Energy Total tons per sq. inch	18·63	17·71	17·71	—	—	17·98	—	18·37	16·86	—	18·37	15.75	18·37	—	18·37	18·37	15·75	—	12·47

Calibre 381 for battleships "Littorio" and "Vittorio Veneto," and calibre 320 for battleships "Cavour" and "Cesare"; 305/46 A.V., "Duilio" and "Doria" class; 254/45 A., "S. Giorgio" class; 254/45 V., "Pisa"; 203/53 An., 1929, "Zara" class; 203/50 S.An. "Trento" class; 190/45 A.V., "S. Giorgio" and "Pisa" class; 152/53 An., O.T.O., "Colleoni" class; 152/45 S. "Duilio" class; 120/50 An., "Vivaldi" class; 120/50 A.V., "Quarto" and "Cesare"; 120/45 A., "Leone"; 100/47 O.T.O. "Trento," "Zara" and "Colleoni" class.

JAPANESE NAVAL ORDNANCE

Date and Pattern of Gun.	KM. (1)	V. (2)	A. (3)	V. (4)	A. (5)	A. (6)	V. (7)	— (8)	A. (9)	Carried by
Desig. by Calibre, in cms.	40·6	35·6	20·3	15·2	15·2	15·2	15·2	14	12	(1) Mutu Class.
Calibre, in inches	16	14	8	6	6	6	6	5·5	4·7	(2) Ise Class. Husô Class. Kongô Class.
Total length, in feet	..	..	..	..	..	..	..	..	..	
Length of Bore, in ins.	..	..	..	..	..	..	..	..	..	(4) Kongô.
Length of Bore, in cals.	45	45	45	50	50	45	45	50	45	(5) Husô Class. Kongô Class (except Kongô). Yahagi.
Total weight, in tons.	..	83	17·3	8	8·7	8·5	7·5	6·25	3·3	
Weight of Firing Charge, Armour-piercing Projectile lb.	..	..	..	..	..	..	..	..	..	(8) Ise Class. Mutu Class. Kuma Class. Tenryû Class.
Weight { Armour-piercing Projectile lb.	2190	1400	250	100	100	100	100	82	45	
Weight { Common Shell ,,	..	..	..	..	..	..	..	..	..	
Muzzle Velocity, in f.-s., A.P. Projectile	2780	2526	2740	3000	3000	2130	3000	2725	2988	(9) Yodo.
Muzzle Energy in foot-tons	118,000	62,500	13,100	6300	6300	3165	6300	4250	2810	
Perforation at Muzzle,† wrought iron, inches	65	48·2	30·5	25·5	25·5	18·3	25·5	20·8	19·2	
Perforation Krupp Steel, 3000 yds.	13·8 at 10,970 metres	..	10½	6½	6½	4½	6½	..	2½	

† By Tressider's Formula.

NETHERLANDS NAVAL ORDNANCE.

Pattern of Gun :—K. = Krupp ; B. = A. B. Bofors ; V. = Vickers ; H.I.H. = Holl. Industrie Handel Mij.

	K.	K.	K.	B.	H.I.H.	B.	B.	H.I.H.	K.	B.	H.I.H.	B.	H.I.H.	K.	K.	K.	V.	B.
						15 cm. double											2 pdr.	2 pdr. double
Diameter of Bore mm.	280	240	150	150	150	150	120	120	105	88	88	75	75	75	50	50	40	40
Length of Barrel cal.	40	40	50	50	50	50	50	50	50	45	45	55	55	55	40	55	40	60
Weight of Gun kg.	31,000	24,500	7,240	7,250	7,420	7,500	4,060	4,265	2,475	1,475	1,665	1,385	1,665	1,470	245	365	280	320
Weight of Projectile kg.	270	172·85	46	46	46·25	46·25	24	24	18	10	10	5·90	5·90	5·90	1·75	1·76	0·906	0·955
Muzzle Velocity m/sec.	890	814	900	900	900	900	900	900	883	800	800	895	895	895	680	895	600	900
Range max. . . m.	16,100	17,200	22,000	22,000	22,000	22,000	16,000	16,000	12,000	11,400	11,400	10,500	10,500	10,500	6,000	6,000	5,000	8,500
Rounds per Minute .	3	4	10	10	10	20	15	15	15	20	20	28	28	28	25	30	230	240
Weight of Gun, Mounting and Shield kg.	197,424	125,700	19,525	20,500	20,790	72,000	8,610	9,770	8,245	4,603	3,411	4,700	4,700	4,695	1,128	948	910	3,500
Weight of Shield kg.	—	—	5,270	6,100	6,400	24,200	310	310	2,770	—	—	—	—	—	—	—	—	—
Angle of Elevation degr.	15	20	25	29	30	60	30	35	20	70	35	95	90	80	20	15	85	90
Angle of Depression degr.	4	4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

NORWEGIAN NAVAL ORDNANCE.

THE COAST ARTILLERY.

Official designation:— Calibre mm., length cal.	305	280	280	240	210	210	150	150	150	120
	$\frac{H^{*}}{30}$	$\frac{K^{\dagger}}{40}$	$\frac{H^{*}}{14}$	$\frac{H^{*}}{13, 16}$	$\frac{K^{\dagger}}{45}$	$\frac{K^{\dagger}}{45}$	$\frac{K^{\dagger}}{50}$	$\frac{K^{\dagger}}{50}$	$\frac{K^{\dagger}}{47, 5}$	$\frac{K^{\dagger}}{43, 9}$
Mark A. = Armstrong, B. = Bofors, Kr. = Krupp, Wh. = Whitworth, St. Ch. = St. Chamond	B.	Kr.	Wh.	St. Ch.	A.	St. Ch.	A.	B.	A.	A.
Design. by calibre in cm.	30·5	28	28	24	20·93	20·93	14·91	14·92	14·91	12
Calibre in inches	12	11·02	11·02	9·45	8·24	8·24	5·87	5·87	5·87	4·72
Length: Total in mm.	9,150	11,200	4,090	3,158	9,520	9,520	7,720	7,703	7,082	5,400
Length: ,, inches	360·23	440·95	161·02	124·33	374·80	374·80	303·93	303·26	278·81	212·6
Length: Rifled bore in mm.	7358·2	8,235	3,192	2719·7	7866·4	7863·1	6547·7	6359·1	5971·5	4552
Length: ,, ,, inches	289·69	324·21	125·66	107·08	309·7	309·57	257·78	250·36	235·26	179·21
Length: Bore in calibre	30	37	13	12·7	43·8	43·8	50	50	46	43·9
Capacity of Powder Chamber in dm.³	85	164·6	26·2	17·8	56·20	56·20	25·4	28·5	18·12	8·47
,, ,, ,, cubic inches	5,187	10044·7	1598·9	1086·3	3429·6	3429·6	1,550	1739·2	1105·8	517
No. of grooves	80	84	72	72	32	64	36	44	28	26
Twist of rifling in calibres	40–25	45–25	40–15	14–78	0–30	29–89	0–30	45–30	0–30	0–30
Total weight in tons	132	80·8	39·5	20	64	43·9	—	38·4	19·6	5·6
Weight of firing charge, kg.	59	62	7·86–7·95	4·75	24·85	24·85	—	15	9·71	4·5
,, ,, ,, lb.	129·8	136·4	17·3–17·5	10·45	54·67	54·67	—	33	21·36	9·9
Weight of projectile, kg.	385·6	345–255	345–215	215	140	140	45	45	45	20·4
,, ,, ,, lb.	848·3	759–561	759–473	473	308	308	99	99	99	44·9
Muzzle velocity, m./sec.	615	630–706	290–350	285	700	700	900	900	778	783
,, ,, feet/sec.	2017·8	2067–2316·4	952·4–1148·4	935·1	2296·7	2296·7	2961·9	2961·9	2552·6	2569
Muzzle energy in m. tons	7433·5	6979·2–6477·2	1478·8–1342·4	890·1	3500	3500	1857·8	1857·8	1388	638
Muzzle energy ,, foot tons	24389·3	22898·8–21251·7	4851·9–4403	2920·4	11483·5	11483·5	6095·4	6095·4	4554	2093·3

* Howitzer. † K means gun.

NORWEGIAN NAVAL ORDNANCE.

The Navy.

Official designation:— Calibre mm., length cal.		210/44	150/46	120/44	120/44	100/40	76/50	76/40	76/28	76/28 A.A.	76/21 A.A.	65/43
Mark A. = Armstrong, B. = Bofors, N. = Nordenfelt		A.	A.	A. N.	B.	B.	B.	A.	B.	B.	B.	H. N.
Design. by calibre in cm.		20·93	14·91	12	12	10·16	7·6	7·6	7·6	7·6	7·6	6·5
Calibre in inches		8·24	5·87	4·7	4·7	4	3	3	3	3	3	2·6
Length	Total in mm.	9,520	7,093	5,400	5,610	4,334	4,066	3139·4	2,316	2,316	1,782	3,025
	,, in inches	374·8	279·25	212·6	220·9	170·6	160	123·6	91·2	91·2	70·2	119·1
	Rifled bore in mm.	7,866	5,949	4,552	4,524	3,397	3243·6	2,600	1834·1	1834·1	1300·1	2333·5
	,, ,, in inches	309·7	234·2	179·2	178·1	133·7	127·7	102·4	72·2	72·2	51·2	91·9
	Powder chamber in mm.	1,234	828	661·6	769	587·2	518·45	410·7	251·7	251·7	251·7	421
	,, ,, ,, inches	48·6	32·6	26	30·3	23·1	20·4	16·2	9·91	9·91	9·91	16·57
	Bore in calibres	43·8	45·8	44	44·1	40	50	40	28	28	21	43·4
No. of grooves		32	28	26	36	32	28	16	28	28	28	26
Twist of rifling in calibres		0–30	0–30	0–30	25·6	30	30	0–30	27	27	30	0–28
Total weight in tons		96·5	17·9–12·9	8·56	8	5	2	3·15–1·43	0·974	1·3	0·888	1·63
Weight of firing charge, kg.		26	10·7	4·5	4·88	3·25	1·75	1·05	0·46	0·46	0·46	0·9
,, ,, ,, lb.		57·3	22·2	9·92	10·76	7·16	3·85	2·31	1·01	1·01	1·01	1·98
Weight of projectile, kg.		142	45	20·41	21	14·06	5·67	5·67	5·67	5·67	5·67	4·0
,, ,, ,, lb.		313	99·3	44·9	46·3	31	12·5	12·5	12·5	12·5	12·5	8·8
Muzzle velocity, m. sec.		700	800–808	783	800	775	860	674	500	500	460	725
,, ,, feet sec.		2,297	2,625–2,651	2,569	2,625	2,543	2,887	2,211	1,640	1,640	1,510	2,379
Muzzle energy	in m. tons	3,500	1,468–1,500	638	685	429	214	131	72·2	72·2	61·2	107
	in foot tons	11,484	4,817–4,992	2,093	2,248	1,408	702	430	237	237	200	351

SPANISH NAVAL ORDNANCE.

Calibre.	Length.	Weight of Gun.	Total Weight.	Weight of Charge.	Weight of Shell.	Initial Velocity.	Muzzle Energy.
	m.	kgs.	kgs.	kgs.	kgs.	m.p.s.	Tn. m.
305 mm.	15·659	65,646	91,131	130	385·55	894	15,984
203·2 ,, ...	10·476	15,900	40,250	35·8	116·1	885	4,698
152·4 ,, ...	7·867	8,738	21,337	15	45·36	900	1,920
120 ,, ...	5·582	3,226	9,639	6·4	22	850	813
120 ,, (G.A.) . .	5·691	2,985	10,655	6·1	22	853	818·5
101·6 ,, 50 C. . . .	5·292	2,120	5,893	5·275	14·06	914	598
101·6 ,, 45 C. . . .	4·770	1,840	8,657	3·9	14·06	823	485
101·6 ,, 40 C. . . .	4·231	1,264	4,750	2·5	14·06	701	352
76·2 ,, 50 C. . . .	3·987	973	2,154	1·6	5·67	823	200
76·2 ,, 45 C. . . .	3·601	823	2,953	1·5	5·67	792	185

A. B. BOFORS—GUNS AND MOUNTINGS

Tables corrected by the Manufacturers, January, 1938.

NAVAL GUNS AND MOUNTINGS.

		25 mm.	25 mm. double.	40 mm.	40 mm.	40 mm. double	75 mm.	75 mm.	75 mm. double	88 mm.	102 mm.	105 mm.	105 mm. double
System		Auto.	Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore	mm.	25	25	40	40	40	75	75	75	88	102	105	105
Length of Barrel. . . .	cal.	64	64	43	60	60	40	49	60	45	50	40	50
Weight of Gun	kg.	75	75	165	220	220	430	615	1,195	1,665	2,430	1,180	2,550
,, Projectile. . .	kg.	0·250	0·250	1·0	1·0	1·0	6·5	6·5	6·5	10	14	16	16
Muzzle Velocity	m.s.	850	850	700	850	850	600	750	850	800	850	700	800
Range, max.	m.	5,500	5,500	9,980	11,200	11,200	11,200	14,300	16,000	16,000	18,300	14,600	18,200
Rounds per Minute		180	360	120	120	240	30	28	50	20	15	14	25
Weight of Gun, Mounting, and Shield	kg.	570	900	900	1,100	2,850	1,410	1,775	8,300	3,550	7,590	2,950	22,100
Weight of Shield . . .	kg.	—	—	—	—	—	240	—	—	—	—	—	4,500
Angle of Elevation . . .	deg.	90	90	90	90	90	40	80	90	40	80	32	85
,, Depression . .	deg.	10	10	10	10	10	10	5	10	10	10	10	10

NAVAL GUNS AND MOUNTINGS—*continued.*

		12 cm.	12 cm.	12 cm. double	15 cm.	15 cm.	15 cm. double	20·3 cm. double	25·4 cm. double	28 cm. double
Diameter of Bore	mm.	120	120	120	149·1	149·1	149·1	203	**254**	**283**
Length of Barrel	cal.	45	50	50	45	50	50	50	**45**	**50**
Weight of Gun.	kg.	2,600	4,100	4,100	6,100	7,865	7,500	22,500	**37,900**	**50,000**
,, Projectile	kg.	21	24	24	46	46	46	115	**225**	**305**
Muzzle Velocity	m.s.	800	900	900	835	900	900	900	**850**	**900**
Range, max.	m.	19,300	19,500	19,500	19,600	24,500	24,500	28,000	**30,300**	**30,000**
Rounds per Minute		12	10	18	8	7	15	12	**8**	**6**
Weight of Gun, Mounting, and Shield .	kg.	8,700	11,000	20,000	17,860	28,300	72,000	170,000	**320,000**	**703,600**
Weight of Shield	kg.	800	1,500	1,600	4,550	12,000	24,200	29,000	**114,000**	**107,000**
Angle of Elevation	deg.	45	30	30	30	60	60	45	**45**	**35**
,, Depression	deg.	10	10	10	10	10	10	5	**10**	**8**

A.B. Bofors—Guns and Mountings. *Howitzers and Field Guns.*

		75 mm. light Field Gun	75 mm. Field.	75 mm. Field.	10.5 cm. Field Howr.	10·5 cm. Field.	10·5 cm. Field.	15 cm. Field Howr.	15 cm. Field Howr.	15 cm. Field.	21 cm. Field Howr.
Diameter of Bore	mm.	75	75	75	105	105	105	152·4	149·1	149·1	216
Length of Barrel	cal.	24	40	46	24	42	46	22	24	43	14
Weight of Gun	kg.	265	365	400	495	1,200	1,380	1,470	1,825	5,250	2,780
,, Projectile	kg.	6·5	6·5	6·5	14	15·3	16·5	41	41	46	100
Muzzle Velocity	m.s.	500	625	710	525	785	800	475	580	825	475
Range, max.	m.	10,200	12,500	14,000	11,000	17,000	18,200	12,000	15,000	22,500	13,000
Rounds per Minute		25	25	25	12	10	10	8	6	—	3
Weight of Gun, Mounting and Shield	kg.	920	1,350	1,550	1,750	3,750	4,200	4,300	5,600	12,000	7,800
Angle of Elevation	deg.	50	45	45	45	45	45	45	45	45	70
,, Depression	deg.	10	5	5	5	3	3	3	5	0	6

		Tank Guns.		Infantry Guns.					Mountain Howitzers.	
				37–81 mm.		47–75 mm.				
		37 mm.	47 mm.	37 mm. Barrel.	81 mm. Barrel.	47 mm. Barrel.	75 mm. Barrel.	37 mm.	75 mm.	105 mm.
Diameter of Bore	mm.	37	47	37	81	47	75	37	75	105
Length of Barrel	cal.	45	33	45	20	33	20	45	22	12
Weight of Gun	kg.	105	105	144		130		103	256	290
,, Projectile	kg.	0·7	1·5	0·7	4·4	1·5	4·5	0·7	6·5	12
Muzzle Velocity	m.s.	800	560	800	320	560	300	800	470	300
Range, max.	m.	6,400	5,400	7,100	6,000	6,500	5,400	6,400	10,000	6,600
Rounds per Minute		30	30	25	20	25	20	30	25	12
Weight of Gun, Mounting and Shield	kg.	300	300	450		425		335	790	840
Angle of Elevation	deg.	25	25	80		60		25	50	40
,, Depression	deg.	10	10	8		5		10	10	10

A.B. BOFORS—GUNS AND MOUNTINGS. *Anti-Aircraft Guns.*

		25 mm. Fixed.	25 mm. Mobile.	40 mm. Fixed.	40 mm. Mobile.	75 mm. Mobile.	75 mm. Mobile.	75 mm. Fixed.	80 mm. Mobile.	102 mm. Fixed.	105 mm. Mobile.
System		Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore . . .	mm.	25	25	40	40	75	75	75	80	102	105
Length of Barrel . . .	cal.	64	64	60	60	50	60	60	50	50	44
Weight of Projectile . .	kg.	0·250	0·250	1·0	1·0	6·5	6·5	6·5	8	14	16
Muzzle Velocity	m.s.	850	900	850	850	750	840	870	750	850	750
Rounds per Minute	.	180	180	120	120	30	25	25	25	15	12
Weight of Gun and Mounting	kg.	500	660	900	2,000	2,600	4,000	3,400	4,000	7,000	6,200
Angle of Elevation . . .	deg.	90	90	90	90	85	85	85	85	85	85
,, Depression. . .	deg.	10	5	10	5	3	5	5	3	5	5

UNITED STATES NAVAL ORDNANCE.

GUN.	MARK.	Length in Calibres.	Total Length.	Capacity of Chamber in Cubic Inches.	Travel of Projectile in Inches.	Weight of Gun.	Weight of Projectile.	Weight of Charge.	Muzzle Velocity.	Muzzle Energy.	Penetration at Muzzle, Krupp Armour, using Capped-Projectile.
			inch.			tons.	lb.	lb.	ft.-seconds.	ft.-tons.	inch.
3-in. S.A.	V., VI.	50	159	219	128·8	1·0	13	3·85	2700	658	3·3
4-in. R.F.G.	III., IV., V., VI.	40	164	331	134·5	1·5	33	4·85	2000	915	3·4
4-in. R.F.G.	VII.	50	205	652	168·3	2·6	33	9·0	2500	1,430	4·6
4-in. R.F.G.	VIII.‡	50	205	652	168·3	2·9	33	12·3	2800	1,794	5·3
5-in. R.F.G.	II., III., IV.	40	206	656	167·8	3·1	50	10·0	2300	1,845	5·3
5-in. B.L.R.	V., VI.	50	256	1,200	215·6	4·6	60	19·2	2700	3,032	6·2
5-in. B.L.R.	VI.	50	256	1,200	215·6	4·6	50	20·5	3000	3,122	6·4
5-in. R.F.G.	VII.†	51	261	1,135	215·6	5·0	50	23·8	3150	3,439	6·8
6-in. R.F.G.	II., III.	30	196	1,318	145·4	4·8	105	18·8	1950	2,768	5·3
6-in. R.F.G.	IV., VII.	40	256	1,320	205·8	6·0	105	18·8	2150	3,365	6·0
6-in. R.F.G.	IX.	45	270	1,320	221·7	7·0	105	18·8	2250	3,685	6·3
6-in. B.L.R.	VI.	50	300	2,101	247·5	8·3	105	30·0	2600	4,920	8·0
6-in. B.L.R.	VIII.	50	300	2,101	247·5	8·6	105	37·0	2800	5,707	8·3
7-in. B.L.R.	II.	45	328	3,643	259·8	12·7	165	58·0	2700	8,338	9·6
8-in. B.L.R.	III., IV.	35	305	3,170	245·8	13·1	260	43·8	2100	7,948	8·6
8-in. B.L.R.	V.	40	343	5,243	273·1	18·1	260	78·0	2500	11,264	10·6
8-in. B.L.R.	VI.	45	369	5,243	299·1	18·7	260	98·5	2750	13,360	12·0
10-in. B.L.R.	I., II.	30	329	6,779	251·1	25·1	510	93·0	2000	14,141	10·7
10-in. B.L.R.	III.	40	413	10,222	327·0	34·6	510	207·5	2700	25,772	15·6
12-in. B.L.R.	I., II.	35	441	11,991	345·2	45·3	870	160·0	2100	26,596	14·2
12-in. B.L.R.	III., IV.	40	493	17,096	392·2	52·1	870	237·5	2400	34,738	16·8
12-in. B.L.R.	III., IV.	40	493	17,096	392·2	52·1	870	305·0	2600	40,768	18·5
12-in. B.L.R.	V.	45	553	16,974	452·0	52·9	870	305·0	2700	43,964	19·4
12-in. B.L.R.	VI.	45	553	14,970	452·0	53·6	870	340·0	2850	48,984	20·8
12-in. B.L.R.	VII.	50	607	14,296	506·3	56·1	870	340·0	2950	52,483	21·7
13-in. B.L.R.	I., II.	35	479	15,068	374·9	61·4	1130	180·0	2000	31,333	15·0
14-in. B.L.R.	I.	45	642	..	..	63·6	1400	365·0	2600	65,606	39·7*
14-in. B.L.R.	II.	50	700	..	..	82·2	1400	..	2800	76,180	44·1
16-in. B.L.R.	..	45	..	..	..	105·0	2100		2006	98,500	45·95
16-in. B.L.R.	..	50	..	..	..	130·0	2100		2800	114,270	51·08

* De Marre formula.

† All battleships from the Delaware class onward have this gun for torpedo defence.

‡ There is now a 4-in. 50-cal. anti-aircraft gun.

The U.S. Navy has a 5-in. 25-calibre A.A. gun; a 6-in. 53-calibre gun; and an 8-in. 55-calibre gun, but complete details are not yet published.

MISCELLANEOUS

INTERNATIONAL AGREEMENT FOR COLLECTIVE MEASURES AGAINST PIRATICAL ATTACKS IN THE MEDITERRANEAN BY SUBMARINES.

NYON, SEPTEMBER 14, 1937.

(Cmd. 5568)

WHEREAS arising out of the Spanish conflict attacks have been repeatedly committed in the Mediterranean by submarines against merchant ships not belonging to either of the conflicting Spanish parties ; and

Whereas these attacks are violations of the rules of international law referred to in Part IV of the Treaty of London of the 22nd April, 1930,* with regard to the sinking of merchant ships and constitute acts contrary to the most elementary dictates of humanity, which should be justly treated as acts of piracy ; and

Whereas without in any way admitting the right of either party to the conflict in Spain to exercise belligerent rights or to interfere with merchant ships on the high seas even if the laws of warfare at sea are observed and without prejudice to the right of any participating Power to take such action as may be proper to protect its merchant shipping from any kind of interference on the high seas or to the possibility of further collective measures being agreed upon subsequently, it is necessary in the first place to agree upon certain special collective measures against piratical acts by submarines :

In view thereof the undersigned, being authorised to this effect by their respective Governments, have met in conference at Nyon between the 9th and the 14th September, 1937, and have agreed upon the following provisions which shall enter immediately into force :—

I. The Participating Powers will instruct their naval forces to take the action indicated in paragraphs II and III below with a view to the protection of all merchant ships not belonging to either of the conflicting Spanish parties.

II. Any submarine which attacks such a ship in a manner contrary to the rules of international law referred to in the International Treaty for the Limitation and Reduction of Naval Armaments signed in London on the 22nd April, 1930, and confirmed in the Protocol signed in London on the 6th November, 1936,* shall be counter-attacked and, if possible, destroyed.

III. The instruction mentioned in the preceding paragraph shall extend to any submarine encountered in the vicinity of a position where a ship not belonging to either of the conflicting Spanish parties has recently been attacked in violation of the rules referred to in the preceding paragraph in circumstances which give valid grounds for the belief that the submarine was guilty of the attack.

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* See " Treaty Series No. 29 (1936)," Cmd. 5302.

IV. In order to facilitate the putting into force of the above arrangements in a practical manner, the Participating Powers have agreed upon the following arrangements :—

1. In the western Mediterranean and in the Malta Channel, with the exception of the Tyrrhenean Sea, which may form the subject of special arrangements, the British and French fleets will operate both on the high seas and in the territorial waters of the Participating Powers, in accordance with the division of the area agreed upon between the two Governments.

2. In the eastern Mediterranean,

(*a*) Each of the Participating Powers will operate in its own territorial waters ;

(*b*) On the high seas, with the exception of the Adriatic Sea, the British and French fleets will operate up to the entrance to the Dardanelles, in those areas where there is reason to apprehend danger to shipping in accordance with the division of the area agreed upon between the two Governments. The other Participating Governments possessing a sea border on the Mediterranean, undertake, within the limit of their resources, to furnish these fleets any assistance that may be asked for ; in particular, they will permit them to take action in their territorial waters and to use such of their ports as they shall indicate.

3. It is further understood that the limits of the zones referred to in sub-paragraphs 1 and 2 above, and their allocation shall be subject at any time to revision by the Participating Powers in order to take account of any change in the situation.

V. The Participating Powers agree that, in order to simplify the operation of the above-mentioned measures, they will for their part restrict the use of their submarines in the Mediterranean in the following manner :—

(*a*) Except as stated in (*b*) and (*c*) below, no submarine will be sent to sea within the Mediterranean.

(*b*) Submarines may proceed on passage after notification to the other Participating Powers, provided that they proceed on the surface and are accompanied by a surface ship.

(*c*) Each Participating Power reserves for purposes of exercises certain areas defined in Annex I hereto in which its submarines are exempt from the restrictions mentioned in (*a*) or (*b*).

The Participating Powers further undertake not to allow the presence in their respective territorial waters of any foreign submarines except in case of urgent distress, or where the conditions prescribed in sub-paragraph (*b*) above are fulfilled.

VI. The Participating Powers also agree that, in order to simplify the problem involved in carrying out the measures above described, they may severally advise their merchant shipping to follow certain main routes in the Mediterranean agreed upon between them and defined in Annex II hereto.

VII. Nothing in the present agreement restricts the right of any Participating Power to send its surface vessels to any part of the Mediterranean.

VIII. Nothing in the present agreement in any way prejudices existing international engagements which have been registered with the Secretariat of the League of Nations.

IX. If any of the Participating Powers notifies its intention of withdrawing from the present arrangement, the notification will take effect after the expiry of thirty days and any of the other Participating Powers may withdraw on the same date if it communicates its intention to this effect before that date.

Done at Nyon this fourteenth day of September nineteen hundred and thirty-seven, in a single copy, in the English and French languages, both texts being equally authentic, and which will be deposited in the archives of the Secretariat of the League of Nations.

Anthony Eden:	United Kingdom of Great Britain and Northern Ireland.
G. Kiosséivanoff N. Momtchiloff	Bulgaria.
Wacyf Boutros-Ghali H. Afifi	Egypt.
Yvon Delbos:	France.
N. Mavroudis N. Politis S. Polychroniadis	Greece.
Victor Antonesco:	Roumania
Dr. R. Aras:	Turkey.
Maxime Litvinoff:	Union of Soviet Socialist Republics.
Bojidar Pouritch:	Yugoslavia.

ANNEX I.

AREAS RESERVED FOR SUBMARINE EXERCISES.

In accordance with paragraph V, sub-paragraph (*c*) of the Arrangement, the participating Powers reserve for the purposes of exercises the areas defined below, within which their submarines will be exempt from the restrictions mentioned in paragraph V, sub-paragraphs (*a*) and (*b*) of the Arrangement.

United Kingdom of Great Britain and Northern Ireland.—Area No. 1: *In the vicinity of Gibraltar.* Area No. 2: *West of Island of Lemnos.* Area No. 3: *Malta.* Area No. 4: *Cyprus.*

Bulgaria.—Nil.

Egypt.—Nil.

France.—Area No. 1: *Gulf of Tunis.* Area No. 2: *Off Toulon.* Area No. 3: *Gulf of Hammamet.*

Greece.—Area No. 1: *Gulf of Corinth.* Area No. 2: *Gulf of Athens.*

Roumania.—Does not require any zone in the Mediterranean.

Turkey.—The area covered by the territorial waters joining the Straits to the militarised zone of Smyrna. The Turkish Government reserves three other areas, viz.: the Straits of the Dardanelles, the Sea of Marmora and the Black Sea.

Union of Soviet Socialist Republics.—Does not require any zone in the Mediterranean.

Yugoslavia.—The area North of River Boyana.

ANNEX II.

MAIN ROUTES * WHICH EACH SIGNATORY POWER MAY ADVISE ITS MERCHANT SHIPS TO FOLLOW.

1. In accordance with paragraph VI the following main routes are hereby agreed:—

Route No. 1: Gibraltar–Port Said (or Eastern Mediterranean).
Pass through the points A, B, C, D, E, M.
Route No. 2: Gibraltar–Spanish ports–Marseilles.
Pass through the points A, F, G.
Route No. 3: Gibraltar–Marseilles (East of Bolearics).
Pass through the points A, H.
Route No. 4: Gibraltar–Genoa.
Pass through the points A, H.
Route No. 5: Algiers–Marseilles or Genoa.
Pass through the points B, H.
Route No. 6: Marseilles–Bizerta–Port Said.
Pass through the points I, C, D, E.
Route No. 7: Marseilles–Messina–Port Said.
Through points J, E.
Route No. 8: Ægean and Black Sea–Western Mediterranean.
Pass point E and Cervi and Doro Channels.
Route No. 9: Spanish ports–Eastern Mediterranean–North of Balearics.
Pass point G and Straits of Bonifacio.
Route No. 10: Spanish ports–Eastern Mediterranean–South of Balearics.
Pass the points F, B.
Route No. 11: Adriatic ports–Western Mediterranean.
Pass through the points K, E.
Route No. 12: Adriatic ports–Eastern Mediterranean.
Pass through the points K, L, M.
Route No. 13: Black Sea–Ægean–Alexandria.
Pass through point N and then west of Stampalia Island through Kaso Strait.

2. Ships proceeding to intermediate ports lying off these routes are advised to remain on the above routes until abreast their port of destination and similarly when leaving such ports they are advised to proceed by the most direct course to reach the route in question.

3. The above routes may be altered by agreement—in such manner as may be proved by experience to be advisable.

4. In emergency the local naval authorities operating under this agreement are empowered to vary the route herein recommended.

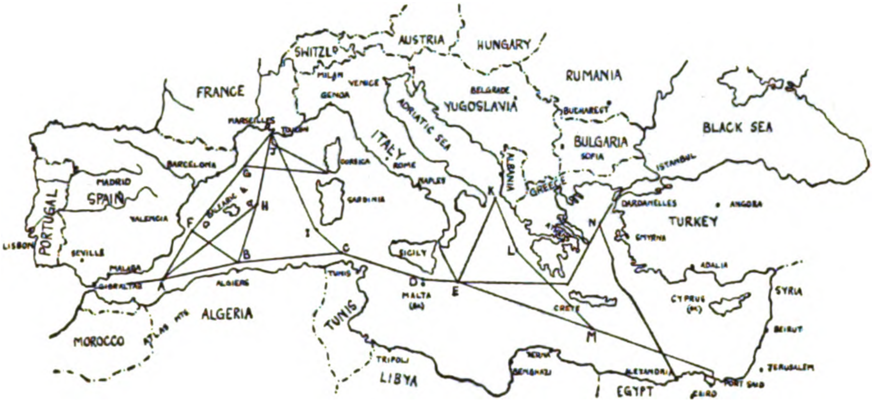
Their decisions shall also be communicated for information to the participating Powers through the diplomatic channel.

* See attached chart.

ADDENDUM TO ANNEXES TO NYON ARRANGEMENT
(paragraphs V (*c*) and VI)

CHART ILLUSTRATING—

Main Routes which Each Signatory Power may advise its Merchant Ships to follow (Annex II).



INTERNATIONAL AGREEMENT FOR COLLECTIVE MEASURES AGAINST PIRATICAL ACTS IN THE MEDITERRANEAN BY SURFACE VESSELS AND AIRCRAFT. (SUPPLEMENTARY TO THE NYON ARRANGEMENT.)

GENEVA, SEPTEMBER 17, 1937.

(Cmd. 5569.)

WHEREAS under the Arrangement signed at Nyon on the 14th September, 1937,* whereby certain collective measures were agreed upon relating to piratical acts by submarines in the Mediterranean, the Participating Powers reserved the possibility of taking further collective measures ; and

Whereas it is now considered expedient that such measures should be taken against similar acts by surface vessels and aircraft ;

In view thereof, the undersigned, being authorised to this effect by their respective Governments, have met in conference at Geneva on the seventeenth day of September and have agreed upon the following provisions which shall enter immediately into force :

I. The present Agreement is supplementary to the Nyon Arrangement and shall be regarded as an integral part thereof.

II. The present Agreement applies to any attack by a surface vessel or an aircraft upon any merchant vessel in the Mediterranean not belonging to either of the conflicting Spanish parties, when such attack is accompanied by a violation of the humanitarian principles embodied in the rules of international law with regard to warfare at sea, which are referred to in Part IV of the Treaty of London of the 22nd April, 1930, and confirmed in the Protocol signed in London on the 6th November, 1936.†

III. Any surface war vessel, engaged in the protection of merchant shipping in conformity with the Nyon Arrangement, which witnesses an attack of the kind referred to in the preceding paragraph shall :

(*a*) If the attack is committed by an aircraft, open fire on the aircraft ;

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* Treaty Series No. 38 (1937), Cmd. 5568.

† Treaty Series No. 29 (1936), Cmd. 5302.

(*b*) If the attack is committed by a surface vessel, intervene to resist it within the limits of its powers, summoning assistance if such is available and necessary.

In territorial waters each of the Participating Powers concerned will give instructions as to the action to be taken by its own war vessels in the spirit of the present Agreement.

Done at Geneva this seventeenth day of September, 1937, in the English and French languages, both texts being equally authentic, in a single copy which will be deposited in the archives of the Secretariat of the League of Nations.

Anthony Eden :	United Kingdom of Great Britain and Northern Ireland
G. Kiosséivanoff N. Momtchiloff	Bulgaria
Wacyf Boutros-Ghali H. Afifi	Egypt
Yvon Delbos :	France
N. Mavroudis N. Politis S. Polychroniadis	Greece
Victor Antonesco :	Roumania
Dr. R. Aras :	Turkey
Maxime Litvinoff :	Union of Soviet Socialist Republics
Bojidar Pouritch :	Yugoslavia

AGREEMENT BETWEEN HIS MAJESTY'S GOVERNMENT IN THE UNITED KINGDOM AND THE GERMAN GOVERNMENT PROVIDING FOR THE LIMITATION OF NAVAL ARMAMENT AND THE EXCHANGE OF INFORMATION CONCERNING NAVAL CONSTRUCTION, WITH DECLARATION, PROTOCOL OF SIGNATURE AND EXCHANGE OF NOTES.

London, July 17, 1937.

(Cmd. 5519.)

Note: The Anglo-German and Anglo-Russian Agreements are based upon the 1936 London Naval Treaty. As printed below, the articles which differ from the corresponding articles of the London Treaty are indicated by lines in the margin; omissions of words or clauses are indicated thus ┘ └

The Government of the United Kingdom of Great Britain and Northern Ireland and the German Government;

Desiring to make provision for the limitation of naval armament and for the exchange of information concerning naval construction;

Have agreed as follows:—

Part I.—*Definitions.*

Article 1.

[Identical with Part I of London Naval Treaty, 1936. See Brassey, 1936, p. 362.]

Part II.—*Limitation.*

Article 2.

After the date of the coming into force of the present Agreement, no vessel exceeding the limitations as to displacement or armament prescribed by this Part of the present Agreement shall be acquired by either Contracting Government or constructed by, for or within the jurisdiction of either Contracting Government.

Article 3.

No vessel which at the date of the coming into force of the present Agreement carries guns with a calibre exceeding the limits prescribed by this Part of the present Agreement shall, if reconstructed or modernised, be rearmed with guns of a greater calibre than those previously carried by her.

ARTICLE 4.

1. No capital ship shall exceed 35,000 tons (35,560 metric tons) standard displacement.

2. No capital ship shall carry a gun with a calibre exceeding 16 in. (406 mm.).

3. No capital ship of sub-category (*a*), the standard displacement of which is less than 17,500 tons (17,780 metric tons), shall be laid down or acquired prior to the 1st January, 1943.

4. No capital ship, the main armament of which consists of guns of less than 10 in. (254 mm.) calibre, shall be laid down or acquired prior to the 1st January, 1943.

ARTICLE 5.

1. No aircraft-carrier shall exceed 23,000 tons (23,368 metric tons) standard displacement or carry a gun with a calibre exceeding 6·1 in. (155 mm.).

2. If the armament of any aircraft-carrier includes guns exceeding 5·25 in. (134 mm.) in calibre, the total number of guns carried which exceed that calibre shall not be more than ten.

ARTICLE 6.

1. It is agreed in principle, and subject to the provisions of paragraph 2 below, that no light surface vessel of sub-category (*b*) exceeding 8,000 tons (8,128 metric tons) standard displacement, and no light surface vessel of sub-category (*a*) shall be laid down or acquired prior to the 1st January, 1943.

2. Notwithstanding the provisions of paragraph 1 above, either Contracting Government shall, upon notifying the other Contracting Government of its intentions, have the right to lay down or acquire light surface vessels of sub-category (*a*); or to acquire such vessels by converting light surface vessels of sub-category (*b*). The other Contracting Government shall thereupon be entitled to exercise the same right. In the event of the German Government making a notification as contemplated above, the Government of the United Kingdom is authorised to transmit this decision confidentially to any Power with which it is in treaty relations similar to those of the present Agreement.

3. The provisions of Part III of the present Agreement shall be observed in respect of any vessels constructed as a result of a notification given in accordance with the provisions of the preceding paragraph; except that the Government making the notification shall, during the year in which it is made, have the right to depart from its Annual Programmes of construction and declarations of acquisition, and to alter, for the purposes of paragraph 2 above, the characteristic of any vessels building or which have already appeared in the programmes or declarations. In the event of such departure, no delay in the acquisition, the laying of the keel, or the altering of any vessel shall be necessary by reason of any of the provisions of

Part III of the present Agreement. The particulars mentioned in Article 12 (*b*) shall, however, be communicated to the other Contracting Government before the keels of any vessels are laid. In the case of acquisition, information relating to the vessel shall be given under the provisions of Article 14.

ARTICLE 7.

No submarine shall exceed 2,000 tons (2,032 metric tons) standard displacement or carry a gun exceeding 5·1 in. (130 mm.) in calibre.

ARTICLE 8.

Every vessel shall be rated at its standard displacement, as defined in Article 1A of the present Agreement.

ARTICLE 9.

No preparations shall be made in merchant ships in time of peace for the installation of warlike armaments for the purpose of converting such ships into vessels of war, other than the necessary stiffening of decks for the mounting of guns not exceeding 6·1 in. (155 mm.) in calibre.

ARTICLE 10.

Vessels which were laid down before the date of the coming into force of the present Agreement, the standard displacement or armament of which exceeds the limitations or restrictions prescribed in this Part of the present Agreement for their category or subcategory, or vessels which before that date were converted to target use exclusively or retained exclusively for experimental or training purposes under the provisions of any previous international agreement, shall retain the category or designation which applied to them before the said date.

Part III.—*Advance Notification and Exchange of Information.*

ARTICLES 11 to 21.

(Identical with Part III of London Naval Treaty, 1936, with the addition of the following clause to Article 19.)

2. In the event of negotiations for the conclusion of a general multilateral treaty similar in character to the present Agreement, or of a general arrangement providing for the exchange of information between naval Powers, the Contracting Governments will, notwithstanding that the present Agreement does not provide for the exchange of information as regards auxiliary war vessels, be prepared, in conjunction with the other Powers concerned, to consider entering into an undertaking for the exchange of information in regard to these vessels with their characteristics as enumerated in Article 12 (*b*) of the present Agreement.

Part IV.—*General and Safeguarding Clauses.*

ARTICLES 22 to 26.

(Identical with Part IV of the London Naval Treaty, 1936, with the exception of verbal differences appropriate to a bilateral, as distinct from a multilateral agreement.)

Part V.—*Final Clauses.*

ARTICLE 27.

The present Agreement shall remain in force until the 31st December, 1942.

ARTICLE 28.

1. The Contracting Governments will, during the last quarter of 1940, consult together with a view to entering into a new agreement for the reduction and limitation of naval armament.

2. In the course of the consultation referred to in the preceding paragraph, views shall be exchanged in order to determine whether, in the light of the circumstances then prevailing and the experience gained in the interval in the design and construction of capital ships, it may be possible to agree upon a reduction in the standard displacement or calibre of guns of capital ships to be constructed under future annual programmes, and thus, if possible, to bring about a reduction in the cost of capital ships.

ARTICLE 29.

None of the provisions of the present Agreement shall constitute a precedent for any future treaty.

ARTICLE 30.

The present Agreement shall be ratified and the instrument of ratification shall be exchanged in London as soon as possible. It shall come into force on or after the exchange of ratifications when the Naval Treaty signed in London on the 25th March, 1936,(*) is in force and simultaneously with the similar Naval Agreement between the Government of the United Kingdom and the Government of the Union of Soviet Socialist Republics.(†) The date on which the present Agreement thus comes into force shall be immediately notified to the German Government by the Government of the United Kingdom.

In witness whereof the undersigned, duly authorised to that effect, have signed the present Agreement and have affixed thereto their seals.

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* Cmd. 5136.

† Cmd. 5518.

Done in duplicate in London, the 17th day of July, 1937, in English and German, both texts being equally authentic.

For the Government of the United Kingdom of Great Britain and Northern Ireland:

(L.S.) ANTHONY EDEN.
(L.S.) DUFF COOPER.

For the German Government:

(L.S.) JOACHIM V. RIBBENTROP.

DECLARATION.

THE Undersigned, duly authorised to that effect by their respective Governments, have agreed on the following Declaration relative to certain matters arising out of the Agreement regarding the Limitation of Naval Armament (hereinafter styled the Agreement of 1935) embodied in the Notes exchanged between the Government of the United Kingdom of Great Britain and Northern Ireland and the German Government on the 18th June, 1935.(*)

ARTICLE 1.

In the present Declaration the following expressions have the meanings herein set out:—

(i) The term 35 per cent. ratio when used with reference to the whole German fleet denotes the proportion of 35 : 100 which, under the Agreement of 1935, the total tonnage of the German fleet bears to the total tonnage of the aggregate naval forces of the members of the British Commonwealth of Nations. The term German fleet means that part of the German naval forces to which, in the aggregate, the 35 per cent. ratio applies.

When used with reference to a category of vessels of war, the term 35 per cent. ratio denotes a proportion of 35 : 100 between the total tonnage of any category of vessels in the German fleet to which, under the Agreement of 1935, this ratio applies, and the total tonnage of the corresponding category of vessels in the aggregate naval forces of the British Commonwealth of Nations.

(ii) The expression "maximum standard displacement permitted by treaty" for an individual vessel of any category denotes the standard displacement of the largest vessel of that category which it is permissible to build under the Agreement signed this day for the Limitation of Naval Armament and the Exchange of Information concerning Naval Construction (hereinafter styled the Agreement signed this day), or under any subsequent instrument by which the two Governments may both be bound.

(iii) A transfer of tonnage as contemplated by paragraph 2 (*d*) of the Agreement of 1935 takes place when the tonnage of a given category of vessels is increased so as to exceed the 35 per cent. ratio

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(*) "Treaty Series No. 22 (1935)." (Cmd. 4953).

for that category, and such increase is at the same time set off by a corresponding reduction below the 35 per cent. ratio of the tonnage in another category.

(iv) An adjustment of tonnage takes place when tonnage is constructed or acquired so as to cause the 35 per cent. ratio for the whole German fleet to be exceeded, in the manner contemplated by paragraph 2 (*g*) of the Agreement of 1935.

(v) The term category with reference to cruisers and destroyers denotes one category inclusive of both types of vessel. This category does not, however, include vessels of the type defined in Article 8 of the Treaty for the Limitation and Reduction of Naval Armament, signed in London on the 22nd April, 1930,(*) which are not subject to the Agreement of 1935 or to the present Declaration.

(vi) Except as otherwise provided in the present Declaration, the terms and expressions defined in Part I of the Agreement signed this day bear the same meanings in the present Declaration.

ARTICLE 2.

The present Declaration does not relate to submarines which are and remain regulated exclusively by paragraph 2 (*f*) of the Agreement of 1935. Nothing in the present Declaration shall affect the rights or obligations of either Government arising under that paragraph.

ARTICLE 3.

The transfers and adjustments of tonnage which may be made in pursuance of paragraphs 2 (*d*) and 2(*g*) of the Agreement of 1935 shall be those set forth in the succeeding sub-paragraphs. In virtue of Article 2 of the present Declaration, however, these sub-paragraphs do not relate to submarines.

1. The German Government having stated in paragraph 2 (*d*) of the Agreement of 1935 that they favour the system of dividing vessels of war into categories, and that they are in consequence prepared in principle, and subject to paragraph 2 (*b*) of the said Agreement, to apply the 35 per cent. ratio to the tonnage of each category of vessel, and to make any variation of this ratio dependent on future arrangements to this end; it is hereby agreed that the manner and extent of any transfer of tonnage shall be regulated in each case by prior agreement between the two Governments.

2. If the German Government should at any time find that the total tonnage available in a given category on the basis of the 35 per cent. ratio is not exactly divisible by the figure of the maximum standard displacement permitted by treaty for individual vessels in that category, it shall, subject to the limitations and conditions set out below, have the right to effect an adjustment of tonnage; provided (i) that the German Government shall give prior notification to the Government of the United Kingdom of its intention to exercise this right, (ii) that the extent and duration of the proposed adjustment

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* "Treaty Series No. 1 (1931)." (Cmd. 3758).

shall form the subject of discussion between the two Governments, (iii) that in no case shall the adjustment be such as to cause the German fleet to exceed the 35 per cent. ratio by more than half the maximum standard displacement permitted by treaty for an individual capital ship, and (iv) that the maximum duration of any particular adjustment shall be not more than ten years from the date of the notification mentioned under (i) above.

ARTICLE 4.

1. In view of the fact that a number of vessels in the present German fleet were constructed under the limitations imposed by the Treaty of Versailles, it is agreed that, notwithstanding anything to the contrary in the Agreement signed this day, vessels of the following classes shall be deemed to be over-age after the lapse of the periods of time indicated below from their completion :—

	Years.
" Deutschland " class of armoured ships	15
" Emden," " Karlsruhe " and " Nürnberg " class of cruisers	15
" Wolf " and " Möwe " class of destroyers	12

2.—(*a*) Although the Agreement of 1935 allows the German fleet to be constituted, on the basis of the 35 per cent. ratio, entirely out of vessels all of which shall be under-age, the German Government agree in principle that the proportion of over-age to under-age vessels in the light surface vessel category of the German fleet should be approximately the same as may at any time exist in the corresponding category of vessel in the aggregate forces of the British Commonwealth of Nations ; subject, however, to the right to depart from this principle in special circumstances (e.g., heavier naval armament on the part of other European Powers). In this event prior notification will be given to the Government of the United Kingdom, indicating the nature and extent of the departure involved.

(*b*) As the German Government will not for a considerable time possess sufficient over-age tonnage to replace with ships actually over-age the necessary percentage of over-age tonnage, it is agreed that after the lapse respectively of the periods indicated below from the date of completion, the following vessels may be replaced on the over-age list by newer vessels, which shall thereupon be deemed to be over-age for the purposes of the present Declaration and the Agreement of 1935 :—

	Years.
All destroyers of the " Wolf " and " Möwe " classes	16
" Emden," " Karlsruhe " and " Nürnberg "	20
" Königsberg " and " Köln "	21
" Leipzig "	22

ARTICLE 5.

Notwithstanding the definition of over-age in respect of capital ships in the Agreement signed this day, it is agreed that neither of the two Governments will object if the other replaces at any age not less than twenty years any of its capital ships now building or projected, provided the Government effecting such replacement is able to show and shall represent to the other (*a*) that a third Power has laid down a capital ship before the date at which such vessel would normally require to be laid down if intended to replace an existing capital ship which had become over-age in accordance with the above-mentioned definition; and (*b*) that it is in consequence necessary for the Government making the representations to effect replacement before the over-age date for the vessel or vessels in question is reached.

ARTICLE 6.

It is recognised that the definitions of vessels of war contained in Part I of the Agreement signed this day do not affect the scope of the Agreement of 1935. In consequence, the types of vessels to which the limitations of the Agreement of 1935 do not apply are those defined in Article 8 of the Treaty for the Limitation and Reduction of Naval Armament signed in London on the 22nd April, 1930.

In faith whereof the Undersigned have signed the present Declaration and have affixed thereto their seals.

Done in London, the 17th day of July, 1937, in the English and German languages, both texts being equally authentic.

For the Government of the United Kingdom of Great Britain and Northern Ireland:

(L.S.) ANTHONY EDEN.
(L.S.) DUFF COOPER.

For the German Government:

(L.S.) JOACHIM V. RIBBENTROP.

PROTOCOL OF SIGNATURE.

AT the moment of signing the Agreement bearing this day's date, the undersigned, duly authorised to that effect by their respective Governments, have agreed as follows:—

1. If, before the coming into force of the above-mentioned Agreement, the naval construction of any Power, or any change of circumstances, should appear likely to render undesirable the coming into force of the Agreement in its present form, the Contracting Governments will consult as to whether it is desirable to modify any of its terms to meet the situation thus presented.

2. The Contracting Governments will, as a temporary measure, promptly communicate to one another, after the laying down,

acquisition or completion of any vessels in the categories or sub-categories mentioned in Article 12 (*a*) of the Agreement, the information detailed below concerning all such vessels laid down, acquired or completed between the 1st January, 1937, and the date of the coming into force of the Agreement, provided, however, that this obligation shall not continue after the 1st July, 1937 :—

Name or designation ;
Classification of the vessel ;
Standard displacement in tons and metric tons ;
Principal dimensions at standard displacement, namely, length at waterline and extreme beam at or below waterline ;
Mean draught at standard displacement ;
Calibre of the largest gun.

3. The present Protocol, of which the English and German texts shall both be equally authentic, shall come into force on this day's date.

In faith whereof the undersigned have signed the present Protocol and have affixed thereto their seals.

Done in London the 17th day of July, 1937.

For the Government of the United Kingdom of Great Britain and Northern Ireland :

(L.S.) ANTHONY EDEN.
(L.S.) DUFF COOPER.

For the German Government :

(L.S.) JOACHIM V. RIBBENTROP.

EXCHANGE OF NOTES.

No. 1.

Mr. Eden to Herr von Ribbentrop.

Foreign Office,
Your Excellency, *London, July* 17, 1937.

I HAVE the honour, with reference to Article 6, paragraph 1, of the Agreement for the Limitation of Naval Armament and the Exchange of Information concerning Naval Construction signed this day between the Government of the United Kingdom and the German Government, to state my understanding of this matter as follows :—

2. In accordance with the provisions of the Agreement regarding the Limitation of Naval Armament embodied in the Notes exchanged between the Government of the United Kingdom and the German Government on the 18th June, 1935, Germany was entitled in view of the existing strength of the aggregate forces of the British Commonwealth of Nations in that sub-category to construct five cruisers in sub-category (*a*) i.e., cruisers with a maximum displacement of 10,000 tons and a maximum gun calibre of 8 inches. In the course of the discussions which took place between the representatives of

the German and United Kingdom Governments in June 1935 the German Government agreed, as their contribution to the limitation in the construction of large cruisers, to forgo their right to construct the fourth and fifth sub-category (*a*) cruisers, provided that no further vessels in this sub-category were laid down by any other Power. The Government of the United Kingdom having subsequently informed the German Government of the intention of the U.S.S.R. to construct 7 vessels in sub-category (*a*) with a displacement of 8,000 tons and a gun calibre of 7·1 inches, the German Government informed the Government of the United Kingdom that they could no longer maintain their intention not to construct the fourth and fifth (*a*) cruisers, and the Government of the United Kingdom recognised that the German Government were entitled to regard the previous Anglo-German understanding on this point as having lapsed. It was therefore recognised by both Governments that the German Government had the right to lay down these two vessels at any time, or to acquire them by converting sub-category (*b*) into sub-category (*a*) cruisers. Nevertheless, in their earnest desire to prevent the loss of the building holiday for (*a*) cruisers which was agreed to in the London Naval Treaty, the German Government have stated that they are prepared not to avail themselves of their freedom of action unless special circumstances arise which may compel them to do so. Should they decide to exercise their rights in this respect they would before the work of construction or conversion is commenced notify the decision to the Government of the United Kingdom who would be authorised to transmit it confidentially to the other naval Powers with whom they are in similar treaty relations.

3. I have the honour to request your Excellency to confirm the above statement as correctly representing the position concerning this matter.

I have, &c.
ANTHONY EDEN.

No. 2.

Herr von Ribbentrop to Mr. Edu.

(Translation.)
German Embassy,
London, July 17, 1937.

Your Excellency,

I have the honour to acknowledge the receipt of your Excellency's Note of this day's date in which your Excellency stated your understanding of the position regarding Article 6 (1) of the Agreement for the Limitation of Naval Armament and the Exchange of Information concerning Naval Construction signed this day between the German Government and the Government of the United Kingdom, and in which your Excellency requested confirmation of this statement.

2. In reply, I have the honour to assure your Excellency that the statement in question is in accordance with the views of the German Government and is regarded by them as correctly representing the position concerning this matter.

I have, &c.
V. RIBBENTROP.

AGREEMENT BETWEEN HIS MAJESTY'S GOVERNMENT IN THE UNITED KINGDOM AND THE GOVERNMENT OF THE UNION OF SOVIET SOCIALIST REPUBLICS PROVIDING FOR THE LIMITATION OF NAVAL ARMAMENT AND THE EXCHANGE OF INFORMATION CONCERNING NAVAL CONSTRUCTION, WITH PROTOCOL OF SIGNATURE.

London, July 17, 1937.

(Cmd. 5518.)

The Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the Union of Soviet Socialist Republics ;

Desiring to make provision for the limitation of naval armament and for the exchange of information concerning naval construction ;

Have agreed as follows :—

Part I.—*Definitions.*

Article 1.

(Identical with Part I, London Naval Treaty, 1936.)

Part II.—*Limitation.*

Article 2.

(1) After the date of the coming into force of the present Agreement, no vessel exceeding the limitations as to displacement or armament prescribed by this Part of the present Agreement shall be acquired by either Contracting Government or constructed by, for or within the jurisdiction of either Contracting Government.

(2) It is understood, however, that the Soviet Government shall not be bound by the limitations and restrictions of this Part of the present Agreement in so far as the Soviet Far Eastern naval forces are concerned, so long as there shall not be concluded a special agreement between the U.S.S.R. and Japan on this subject. Nevertheless, the Soviet Government will not construct or acquire any vessels exceeding the said limitations and restrictions, except in the event of such construction or acquisition by Japan or any other Power in the ar East.

(3) Should the Soviet Government, as the result of such construction or acquisition by Japan or any other Power in the Far East, decide to construct or acquire vessels exceeding the said limitations

or restrictions, a notification to that effect shall be made to the Government of the United Kingdom, and the vessels concerned shall not be laid down or acquired until after this notification has reached the Government of the United Kingdom. The Soviet Government shall not be obliged in this case to have any recourse to the procedure set out in Article 25 of the present Agreement.

(4) The Government of the United Kingdom will treat as confidential any information received under the preceding paragraph, subject to a right to transmit it confidentially to any Power with which that Government is in treaty relations similar to those of the present Agreement.

(5) Nothing in paragraph (2) above shall entitle the Soviet Government to construct or acquire any vessel exceeding the limitations or restrictions prescribed by this Part of the present Agreement for service, or to employ such a vessel on service, elsewhere than in the Far East, wherever the vessel may be constructed or acquired. The Soviet Government shall equally not be entitled by anything in paragraph (2) above to transfer from the Soviet Far Eastern to the Soviet Baltic or Black Sea Fleet any vessel constructed or acquired in the exercise of the right conferred by that paragraph.

Article 3.

No vessel which at the date of the coming into force of the present Agreement carries guns with a calibre exceeding the limits prescribed by this Part of the present Agreement shall, if reconstructed or modernised, be rearmed with guns of a greater calibre than those previously carried by her.

Article 4.

(1) No capital ship shall exceed 35,000 tons (35,560 metric tons) standard displacement.

(2) No capital ship shall carry a gun with a calibre exceeding 16-in. (406 mm.).

(3) No capital ship of sub-category (*a*), the standard displacement of which is less than 17,500 tons (17,780 metric tons), shall be laid down or acquired prior to the 1st January, 1943.

(4) No capital ship, the main armament of which consists of guns of less than 10-in. (254 mm.) calibre, shall be laid down or acquired prior to the 1st January, 1943.

Article 5.

(1) No aircraft-carrier shall exceed 23,000 tons (23,368 metric tons) standard displacement or carry a gun with a calibre exceeding 6·1-in. (155 mm.).

(2) If the armament of any aircraft-carrier includes guns exceeding 5·25-in. (134 mm.) in calibre, the total number of guns carried which exceed that calibre shall not be more than ten.

ARTICLE 6.

(1) It is agreed in principle, and subject to the provisions of paragraph (2) below, that no light surface vessel of sub-category (*b*) exceeding 8,000 tons (8,128 metric tons) standard displacement, and no light surface vessel of sub-category (*a*) shall be laid down or acquired prior to the 1st January, 1943.

(2) Notwithstanding the provisions of paragraph (1) above, either Contracting Government shall, upon notifying the other Contracting Government of its intentions, have the right to lay down or acquire light surface vessels of sub-category (*a*) ; or to acquire such vessels by converting light surface vessels of sub-category (*b*). The other Contracting Government shall thereupon be entitled to exercise the same right. In the event of the Soviet Government making a notification as contemplated above, the Government of the United Kingdom is authorised to transmit this decision confidentially to any Power with which it is in treaty relations similar to those of the present Agreement.

(3) The provisions of Part III of the present Agreement will be observed in respect of any vessels constructed as a result of a notification given in accordance with the provisions of the preceding paragraph ; except that the Government making the notification shall, during the year in which it is made, have the right to depart from its Annual Programmes of construction and declarations of acquisition, and to alter, for the purposes of paragraph (2) above, the characteristic of any vessels building or which have already appeared in the programmes or declarations. In the event of such departure, no delay in the acquisition, the laying of the keel, or the altering of any vessels shall be necessary by reason of any of the provisions of Part III of the present Agreement. The particulars mentioned in Article 12 (*b*) shall, however, be communicated to the other Contracting Government before the keels of any vessels are laid. In the case of acquisition, information relating to the vessel shall be given under the provisions of Article 14.

ARTICLE 7.

No submarine shall exceed 2,000 tons (2,032 metric tons) standard displacement or carry a gun exceeding 5·1 in. (130 mm.) in calibre.

ARTICLE 8.

Every vessel shall be rated at its standard displacement, as defined in Article 1A of the present Agreement.

ARTICLE 9.

No preparations shall be made in merchant ships in time of peace for the installation of warlike armaments for the purpose of converting such ships into vessels of war, other than the necessary stiffening of decks for the mounting of guns not exceeding 6·1 in. (155 mm.) in calibre.

ARTICLE 10.

Vessels which were laid down before the date of the coming into force of the present Agreement, the standard displacement or armament of which exceeds the limitations or restrictions prescribed in this Part of the present Agreement for their category or sub-category, or vessels which before that date were converted to target use exclusively or retained exclusively for experimental or training purposes under the provisions of any previous international agreement, shall retain the category or designation which applied to them before the said date.

Part III.—*Advance Notification and Exchange of Information.*

ARTICLE 11.

(1)—(*a*) Each Contracting Government shall communicate every year to the other Contracting Government information, as hereinafter provided, regarding its annual programme for the construction and acquisition of all vessels of the categories and sub-categories mentioned in Article 12 (*a*), whether or not the vessels concerned are constructed within its own jurisdiction, and periodical information giving details of such vessels and of any alterations to vessels of the said categories or sub-categories already completed.

(*b*) It is understood, however, that the Soviet Government shall not be under any obligation to furnish the Government of the United Kingdom with any information regarding any vessels coming within the said categories or sub-categories which may be constructed in the Far Eastern territories of the Soviet Union, for service in the Far East, so long as there shall not be concluded between the Soviet Government and the Japanese Government a special agreement on this subject; and this Part of the present Agreement shall be read subject to this understanding.

(c) Full particulars will be furnished in regard to all vessels acquired by the Soviet Government (wherever the acquisition may take place), and in regard to all vessels constructed in the European territories of the Soviet Union, whether the vessels so acquired or constructed are for service in the Far East or elsewhere.

(*d*) Full particulars will also be furnished in regard to any vessel constructed in the Far Eastern territories of the Soviet Union (i) for service elsewhere than in the Far East, or (ii) for service in the Far East but which it is decided prior to the date of completion to employ for service elsewhere, or (iii) which at any time after being put into commission it is decided to transfer from the Soviet Far Eastern to the Soviet Baltic or Black Sea Fleet. In cases coming under (ii) and (iii), the particulars prescribed by Article 12 (*b*) of the present Agreement shall be furnished as soon as possible after the decision in question has been taken, and the vessel shall not be removed from the Far East until these particulars have reached the Government of the United Kingdom. Nothing in this paragraph shall operate so as to allow the transfer of any vessel in a case in which it would be forbidden under Article 2 (5) of the present Agreement.

(*e*) Nothing in paragraph (*b*) above shall operate so as to absolve the Soviet Government from carrying out the obligations of Article 18 of the present Agreement.

(2) For the purposes of the present Agreement, information shall be deemed to have reached the Government of the United Kingdom on the date on which it is communicated to the British Representative in Moscow, and the Soviet Government on the date on which it is communicated to the Soviet Representative in London.

(3) This information shall be treated as confidential until published by the Contracting Government supplying it.

Articles 12—21.

(Identical with corresponding Articles in London Naval Treaty, 1936, with the addition of the following clause to Article 19.)

(2) In the event of negotiations for the conclusion of a general multilateral treaty similar in character to the present Agreement, or of a general arrangement providing for the exchange of information between naval Powers, the Contracting Governments will, notwithstanding that the present Agreement does not provide for the exchange of information as regards auxiliary war vessels, be prepared in conjunction with the other Powers concerned, to consider entering into an undertaking for the exchange of information in regard to these vessels with their characteristics as enumerated in Article 12 (*b*) of the present Agreement.

Part IV.—*General and Safeguarding Clauses.*

Articles 22 to 26.

(Identical with Part IV, London Naval Treaty, 1936, with the exception of verbal differences appropriate to a bilateral, as distinct from a multilateral agreement.)

Part V.—*Final Clauses.*

Article 27.

The present Agreement shall remain in force until the 31st December, 1942.

Article 28.

(1) The Contracting Governments will, during the last quarter of 1940, consult together with a view to entering into a new agreement for the reduction and limitation of naval armament.

(2) In the course of the consultation referred to in the preceding paragraph, views shall be exchanged in order to determine whether, in the light of the circumstances then prevailing and the experience gained in the interval in the design and construction of capital ships,

it may be possible to agree upon a reduction in the standard displacement or calibre of guns of capital ships to be constructed under future annual programmes, and thus, if possible, to bring about a reduction in the cost of capital ships.

ARTICLE 29.

None of the provisions of the present Agreement shall constitute a precedent for any future treaty.

ARTICLE 30.

The present agreement shall be ratified and the instruments of ratification shall be exchanged in London as soon as possible. It shall come into force on or after the exchange of ratifications, when the Naval Treaty signed in London on the 25th March, 1936,(*) is in force and simultaneously with the similar naval agreement between the Government of the United Kingdom and the German Government.† The date on which the present Agreement thus comes into force shall be immediately notified to the Government of the Union of Soviet Socialist Republics by the Government of the United Kingdom.

In witness whereof the undersigned, duly authorised to that effect, have signed the present Agreement and have affixed thereto their seals.

Done in duplicate in London, the 17th day of July, 1937, in the English language. A Russian text will be drawn up as soon as possible and agreed between the Contracting Governments, and both texts will then be considered equally authentic.

(L.S.) ANTHONY EDEN.
(L.S.) DUFF COOPER.
(L.S.) I. MAISKY.
(L.S.) L. ANTSIPO-CHIKUNSKY.

PROTOCOL OF SIGNATURE.

AT the moment of signing the Agreement bearing this day's date, the undersigned, duly authorised to that effect by their respective Governments, have agreed as follows :—

1. If, before the coming into force of the above-mentioned Agreement, the naval construction of any Power, or any change of circumstances, should appear likely to render undesirable the coming into force of the Agreement in its present form, the Contracting Governments will consult as to whether it is desirable to modify any of its terms to meet the situation thus presented.

2. The Contracting Governments will, as a temporary measure, promptly communicate to one another, after the laying down,

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* Cmd. 5136.

† Cmd. 5519.

acquisition or completion of any vessels in the categories or sub-categories mentioned in Article 12 (*a*) of the Agreement, the information detailed below concerning all such vessels laid down, acquired or completed between the 1st January, 1937, and the date of the coming into force of the Agreement (other than vessels which, in virtue of Article 11 (1) (*b*), there is no obligation to notify), provided, however, that this obligation shall not continue after the 1st July, 1937 :—

Name or designation ;
Classification of the vessel ;
Standard displacement in tons and metric tons ;
Principal dimensions at standard displacement, namely, length at waterline and extreme beam at or below waterline ;
Mean draught at standard displacement ;
Calibre of the largest gun.

3. The present Protocol shall come into force on this day's date.

In faith whereof the undersigned have signed the present Protocol and have affixed thereto their seals.

Done in London the 17th day of July, 1937, in the English language. A Russian text will be drawn up as soon as possible and agreed between the Contracting Governments, and both texts will then be considered equally authentic.

(L.S.) ANTHONY EDEN.
(L.S.) DUFF COOPER.
(L.S.) I. MAISKY.
(L.S.) L. ANTSIPO-CHIKUNSKY.

STATEMENT RELATING TO DEFENCE.

(Cmd. 5682)

I.

The Statements relating to Defence, presented to Parliament in March 1935 (Cmd. 4827), and March 1936 (Cmd. 5107), explained the circumstances which led His Majesty's Government to the conclusion that steps must be taken to make good the serious deficiencies which had accumulated in all the Defence Services, and outlined the objectives aimed at in the plan which had been drawn up for the reconditioning and modernisation of our defence forces. The Statement presented to Parliament in February 1937 (Cmd. 5374), dealt mainly with defence expenditure consequent upon the wide range necessarily covered by the programme and the growth in the complexity and cost of new armaments generally, and gave an indication of the order of magnitude of the expenditure which must be contemplated.

2. The scope of the present paper is necessarily different. The essential features of the policy, underlying the defence programme remain unchanged, and what is needed is rather a survey of the progress achieved, with reference to such changes in organisation or to such special requirements as are likely to be of interest. The paper proceeds upon the assumption, now almost universally accepted, that the steps taken by His Majesty's Government to make good our defences are unavoidable, and that they furnish a steadying influence on the present state of international relations.

It will be appreciated that for reasons of public interest this survey must, for the most part, be expressed in general terms, and that it is impossible to give specific details as to, for example, the output of any particular type of equipment. In some particulars the information will inevitably overlap with that in the separate Memoranda accompanying the Estimates of the Defence Departments.

II.

3. The general lines on which it was proposed to expand capacity for the production of armaments was explained in the White Paper of February 1937. A number of new factories have been brought into production, and others are under construction. Existing factories are working to a high level of output.

4. It is not to be expected that no set-backs should be encountered

in a programme of this magnitude, which, moreover, includes, the development of a number of articles of new design. For example, the full expansion of production necessary to enable the programme to be completed within the time originally contemplated has made demands on the supply of certain materials and on certain types of skilled labour which could not be met without some delay, the more so as it has been the policy to avoid as far as possible interference with the requirements of private industry. The helpful co-operation of all concerned has done much to diminish the difficulties of the situation, but constant attention to this aspect of the programme is required, if the best results are to be obtained from the very large outlays made on the erection and equipment of factories. Regarding the task as a whole, it can be said that, while delays and difficulties have been experienced, and deliveries have not, in some cases, come up to anticipation, progress has on the whole been satisfactory. The difficulties hitherto encountered have been largely met and the rate of production is now rapidly increasing.

5. The supply position in regard to essential raw materials has been kept under continuous survey and further action has been taken as found necessary in the course of the survey to provide for reserves in certain cases.

6. To turn to the Services individually, the speed with which the strength of the Royal Navy is being increased is shown by the following figures of tonnage building at successive dates :—

January 1, 1935	139,345
January 1, 1936	281,925
January 1, 1937	375,740
January 1, 1938	547,014

During the year April 1938–March 1939 some sixty new vessels of all classes are expected to be put into service, representing a total of over 130,000 tons.

7. The programme of new ships to be laid down in 1938 has been planned in accordance with the principles stated in the preceding White Paper, and will consist of : 2 capital ships ; 1 aircraft carrier ; 4 large cruisers ; 3 small cruisers ; 3 submarines ; 3 minelayers ; 2 river gunboats ; 1 destroyer depot ship ; 1 submarine depot ship ; 1 Fleet Air Arm supply and repair ship. The programme will also include boom defence vessels, tugs, motor torpedo boats and miscellaneous small craft.

Modernisation of existing ships is continuing expeditiously. The work on one capital ship has been completed ; three others are in hand for this purpose.

8. As regards the Army, the accumulation of the necessary war reserves is proceeding on a large scale. In the production of nearly all the major articles of armament and equipment for which new designs are being adopted, the stages of design and development are already ended, or are within sight of completion. The present year should see warlike stores of modern pattern in growing use and, what is equally important, the potential means for maintaining and

replacing such stores in time of war will be keeping pace with actual issues.

9. A certain amount of equipment, including vehicles, of modern pattern has already been issued to the Territorial Army, and it is expected that, later in the year, the situation will allow of these issues being substantially increased. As an interim measure, arrangements have been made for the loan of weapons and transport from Regular Army sources for use during the forthcoming camping season. The scale of vehicles for Territorial Army Units this summer will be largely increased.

10. The new types of aircraft were for the most part placed in production before the construction and testing of prototypes. This policy which was deliberately adopted in order to reduce delay to a minimum has involved certain initial difficulties, but it has enabled new types of aircraft to be delivered to squadrons much earlier than would have been possible under the methods used in the past. The types in question have shown a high degree of performance. The equipment, including many new and improved types of armament and instruments, has come fully up to expectations, and deliveries are now proceeding satisfactorily. As a further step to ensure maximum production, the number of types of aircraft in the Service is being progressively reduced, so that not only can a clear run be obtained in each factory on a single type, but it is also possible to arrange for several factories to be engaged in the production of one type.

11. Manufacturing capacity has been substantially developed to provide a sufficient supply of aircraft, engines and equipment. The six shadow factories for the manufacture of engines have already begun production. One of the two airframe shadow factories is expected to begin production a few weeks hence and the other later in the year. Other shadow factories for airscrews and carburettors have also started production, and a shadow factory for bombs is on the point of doing so ; these factories are additions to the programme as at first conceived, and are examples of the enlargements which the working-out of the programme entails.

III.

12. Concurrently with industrial requirements for armament production, the defence programme involves a large number of works services, many of them of considerable magnitude. An instance is the additional storage accommodation, entailing heavy expenditure, for the accumulating reserves of all kinds of the three Services.

13. Good progress has been made with the Army works services for bringing barrack accommodation up to modern standards, and providing the workshops and buildings required for modern mechanised forces, both at home and abroad. A large building programme is also being carried out to provide the new type of accommodation which is necessary for the units and equipment of the two Anti-Aircraft Divisions ; the majority of such units have now been provided with accommodation, either permanent or temporary.

14. The total number of new aerodrome sites acquired since the expansion programme started is 59 ; of which 30 are now occupied by units. In addition large extensions have been made to a number of existing stations.

IV.

15. The organisation of recruitment and training in all three Services has received special attention. Not only are recruits being entered in greatly increased numbers, but the complexity of modern warfare requires the adoption of a higher standard of training.

16. To keep pace with the growing strength of the Fleet, naval personnel has expanded at a steadily increasing rate. Additions were made to total numbers of approximately 3,000 during the years 1933 and 1934, and of approximately a further 10,000 during the years 1935 and 1936. In the year 1937 an increase of over 10,000 has been planned, the effect over the five years being an expansion of about 25 per cent. In 1938 an increase of 7,000 is in contemplation.*

17. There is every reason for confidence that the higher level of entries will be maintained. Actually, during the first three quarters of the year 1937, over 11,000 recruits have been entered for the Navy. Some difficulty has been experienced in the past year in obtaining skilled tradesmen, owing to the demands of the re-armament programme, but the position in this respect is showing most satisfactory improvement.

18. The rapid rate of expansion of naval personnel has taxed to the utmost the organisation for recruiting, training and drafting. At many naval training establishments building has been undertaken to accommodate the larger numbers receiving instruction. The Caledonia (late ss. Majestic), the new boys' training establishment at Rosyth, has proved invaluable and her location has been followed by an increased entry of boys from Scotland.

19. A number of measures have been taken to facilitate and encourage Army recruiting. These measures fall under two headings : revision of the qualifications for enlistment and improvements in conditions of service. Under the first heading, physical and educational standards have been adjusted to suit the duties of the various arms, and in certain Corps the age limit has been raised. Under the second heading there have been increases of ration allowance and of recruits' kit allowance, the improvement of messing and accommodation, the abolition of " holding " for an extra year's service abroad and the granting of permission to soldiers over 21 years of age to sleep out of barracks. During 1937 3,600 more recruits were taken than in the previous year.

20. Last August men serving in sections A and B of the Army Reserve were invited to rejoin the Colours ; up to the end of January some 2,600 had done so.

21. The year 1937 was a record recruiting year for the Territorial

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* The figures are for financial years.

Army, 45,320 recruits being obtained and the strength of all ranks being increased by 17,690.

22. In the Air Force, training facilities have been greatly extended both for pilots and technical personnel, and further extensions will be made. The number of Service flying training schools has been increased from four to eleven, and they have also been relieved entirely of elementary flying training which is now carried out at thirteen civil flying schools. The number of armament training camps has already been increased from three to seven, and others are to be opened later.

23. Notwithstanding the increase of the numbers under training, experience shows that the new pilots are entering the service squadrons from the flying training schools with a higher standard of flying efficiency than formerly. Since April 1935, approximately 4,500 candidates have been accepted for training as pilots, and 40,000 airmen (including 6,300 apprentices) mostly for training in skilled trades, as compared with a typical pre-expansion entry of approximately 300 pilots and 1,600 airmen a year. Recruitment both of officers and men must be maintained at a high level for some time to come, and it is essential that there should be no relaxation of effort and public support.

24. The Royal Air Force Volunteer Reserve, which was recently established to create a reserve of pilots and other personnel, is working very satisfactorily and will be further extended. The estimated pilot entry for the year April 1937–March 1938 was 800, but this programme has already been exceeded, and over 1,000 entrants for the pilot reserve have been accepted since April 1937. The number of centres so far opened is 21, and 12 more will be opened in 1938.

V.

25. Detailed plans are being worked out by the Admiralty and Air Ministry to give effect to the decision taken in July 1937 for the transfer to the Admiralty of the administrative control of the Fleet Air Arm. The Air Ministry will be responsible for the training of pilots up to the point when their specialised training begins, after which the Admiralty will assume full responsibility.

26. Of the four new infantry battalions and two new Army tank battalions referred to in the White Paper of February 1937, two infantry battalions and one tank battalion have been formed, and very satisfactory progress made in building them up to establishment. It is hoped to raise the other tank battalion shortly. The Mobile Division is now in being as a formation, and will train as such this year. Arrangements have been made with the Government of India which will make it possible to continue the mechanisation of cavalry regiments.

Certain of our overseas garrisons have been strengthened, and further increases are in contemplation; steady progress has been made in improving the defences of our overseas bases.

27. In the process of building up an adequate home defence Air Force, the metropolitan strength was raised during the past year to

123 squadrons; the corresponding number in 1934 was 52 squadrons. The present force comprises 68 bomber squadrons, 30 fighter squadrons, 15 squadrons of general reconnaissance aircraft and torpedo bombers, and 10 Army Co-operation squadrons. The necessary organisation is being developed to enable the Force to operate with the maximum efficiency. Further stages of expansion will take the form of increasing progressively the strength of the Royal Air Force both by forming additional squadrons and by increasing the establishments of individual squadrons.

28. The development of active ground defence against air attack has continued throughout the year. More units have been converted to form part of the expanded second Anti-Aircraft Division, and others have been converted and reorganised for Coast Defence purposes. Between April and December, 1937, the two Anti-Aircraft Divisions increased their strength by 345 officers and over 9,000 other ranks. The new types of weapons and equipment to which reference was made in last year's White Paper will shortly be issued. Special attention is being given to the protection of vulnerable points.

29. A successful start has been made with the balloon barrage scheme, most of the material for which has already been delivered. Sufficient regular personnel have been fully trained to enable them to supervise and train in their turn the auxiliary personnel who will be primarily responsible for manning the barrage. Recruiting of the auxiliary personnel, which awaits the completion of the necessary stations, is expected to start in May.

30. As regards the system of organisation, the Air Ministry is responsible for the air defence scheme as a whole and the anti-aircraft units of the Territorial Army, which provide the gun and searchlight defences, come directly under the Air Officer Commander-in-Chief, Fighter Command, for operations in war and combined training in peace. Plans are prepared in a joint Committee, the membership of which includes the Anti-Aircraft Divisional Commanders and representatives of the operations branches of the War Office and Air Ministry, the Air Officer Commander-in-Chief, Fighter Command, being Chairman. The latter has on his staff two General Staff officers from the Army. The Anti-Aircraft Divisional Commanders have their Headquarters with the Commanders of the Fighter Groups in peace. In all operational matters there is direct communication between Headquarters, Fighter Command, and the Anti-Aircraft Divisions.

VI.

31. The measures for the protection of the civilian population against the consequences of air raids have been taken an important stage forward by the Air Raid Precautions Act, 1937, under which Local Authorities will discharge the duty of preparing comprehensive schemes for the purpose, with substantial financial assistance from the Exchequer in respect of approved schemes. The underlying principle is that while the schemes will be prepared under general guidance from the Home Office or Scottish Office, and in

respect of some parts of them under central direction, they will be framed for the requirements of each Local Authority area, thus ensuring the action best adapted to the needs of the locality, and the flexibility without which the scheme might break down in emergency. Air raid precautions depend fundamentally upon a wide diffusion of knowledge among the people of the country, and upon the enrolment and instruction of large numbers of volunteers for the local organisation of public duties.

32. The Local Authorities have already received information on the matters which they should include, both in general air raid precaution schemes and also in fire precaution schemes. Broadly, they are required to provide for the instruction of the public, the enrolment and instruction of voluntary personnel for air raid wardens, first aid parties, first aid posts, etc., arrangements to deal with the dangers of poisonous gases, a survey of accommodation locally available which could be used, with adaptation where necessary, for public shelters, the organisation of the hospital services for casualties, the organisation of emergency fire services, co-ordination with public utility undertakings, lighting restriction and warning systems, as well as the preparation of plans on which the Secretary of State could, if the emergency arose, give directions as to evacuation.

33. The Air Raid Precautions Department has been strengthened and additional numbers of Regional Inspectors are being appointed, who will be able to give up-to-date information and advice to the Local Authorities in the preparation of the details of their schemes.

34. A general training school for Air Raid Precaution Officers of Local Authorities is being opened in London. About 25 to 30 officers will attend each course which will last between two and three weeks. The two schools for anti-gas measures are now fully in operation and a course for superintending instructors in the measures for dealing with incendiary bombs is also beginning. In addition local schools or courses of instruction for air raid wardens and for first aid parties are being set up by Local Authorities in steadily increasing numbers.

35. A large proportion of the gas respirators required to supply the whole civilian population is already available and the balance will have been obtained by the end of this year ; these will be stored in a number of central stores, and quantities of them will be released for storage by Local Authorities as soon as the Authorities have made their arrangements for storage. Similarly the supply of protective clothing for volunteers who will be actively engaged in the schemes proceeds regularly, and arrangements are being made for its partial distribution to Local Authorities.

36. Advice to industrial and commercial undertakings as to the simple and inexpensive measures which they can and should take in order to give reasonable protection to the persons employed in them, has been given in the form of handbooks and additional memoranda are nearing issue. In addition, discussions are proceeding with public utility undertakings as to the steps which can be taken for the maintenance of essential public services of power, light, water, etc. As already announced, in respect of certain special

measures additional to those which all employers will be expected to undertake, His Majesty's Government will be prepared to make a grant to the undertakings towards the cost.

37. As regards the emergency fire precautions, the principal elements are a complete system of fire fighting patrols, *i.e.*, working on regular beats and not dependent upon the ordinary fire brigade stations; they will be for the most part equipped with trailer pumps, with heavy machines in support for fighting the large fires and making use of water supplies of all kinds to supplement the supplies in the mains.

38. The Home Office, working in conjunction with the Office of Works and the Scottish Office, is responsible for the design, production and issue of the equipment for the use of the Local Authorities as their schemes develop. As the result of co-operation with various manufacturers orders have already been placed for about 2,500 light trailers; these are fire pumps coupled up to an engine and mounted on a light chassis which can be towed by an ordinary motor car. In addition, orders have been placed for 200 trailer machines of larger pumping capacity as patrol vehicles for areas of heavier fire risk. Large-scale production of this type will be in progress this year.

Further experiments have led to orders for five types of heavier duty machines primarily for station work, *i.e..*, fighting conflagrations. Some of these types embody radical changes in the design of fire engines, and suitable machines have been produced at half the cost of a fire engine of comparable power. Investigation is also proceeding into the development of other types which will economise in the use of water.

39. Defence planning comprises a variety of tasks, beyond though often closely related to the work of the Home Office in the sphere of passive precautions, for organising our industrial and economic resources for operation in time of war. Schemes are being prepared to ensure the sufficiency and operation of the various transport services, and the flexibility of the transport system to enable sea-borne traffic to be diverted as required to alternative ports. Supplementary to the military plans for the defence of trade and the protection of important points against air attack, the maintenance of adequate supplies of food and feeding-stuffs, including a proper system of control and distribution, has occupied a prominent place in the work. Schemes are proceeding for the maintenance of oil supplies, including measures for conserving the use of oil in emergency and providing alternative methods of propulsion.

VII.

40. In the White Paper presented to Parliament in February 1937, it was stated that it was not possible to determine what would be the peak year of defence expenditure: that must depend on circumstances which could not then be foreseen, and upon decisions to be taken in future years. Taking the programme as it then stood, however, it was stated that it would be imprudent to contemplate a

total expenditure on defence during the next five years of much less than £1,500 millions.

41. Estimates for the current financial year provided for a total expenditure by the three Defence Departments (including Royal Ordnance Factories) of £278¼ millions, of which £80 millions was to be met by issues from the Consolidated Fund under the Defence Loans Act, 1937. In addition, about £5¼ millions was provided for air raid precautions schemes.

42. For the ensuing year 1938, provision is made in the Estimates of the three Defence Departments (including Royal Ordnance Factories) for expenditure amounting to £343¼ millions, of which it is proposed to meet £90 millions by issues from the Consolidated Fund under the Defence Loans Act. In addition, nearly £8·5 millions is provided for air raid precautions services.

43. Present indications are that the defence programmes now in hand are likely to involve defence expenditure in 1939 in excess of the provision made in the Estimates for 1938.

The course of expenditure in subsequent years is necessarily dependent upon circumstances which cannot at present be foreseen, and in particular upon the degree of success which attends the efforts of His Majesty's Government to achieve some appeasement in international affairs.

44. The continuous development of modern armaments has given rise in the past twelve months to a number of new needs; and the growing power and complexity of new weapons tends to increase their cost. The flexibility of the whole programme has made it possible to meet by reductions in other directions some part of the increased cost arising from these tendencies, but under present international conditions they must continue to operate, and to enlarge the total of expenditure. It must therefore be expected that even on the assumption that 1939, as now seems probable, will be the peak year of defence expenditure, the total expenditure on defence over the five financial years 1937–41 will exceed the sum of £1,500 millions mentioned in the White Paper of February 1937.

March 2, 1938.

STATEMENT TO ACCOMPANY NAVY ESTIMATES, 1938.

The provision asked for in the estimates which I now lay before the House would, irrespective of any sum allocated under the Public Loans Act, reach a total of £123,707,000, which is £18,642,000 more than the total of Navy Estimates, 1937. The amount which will be provided from the Consolidated Fund under the provisions of the Defence Loans Act is £30,000,000, compared with £27,000,000 provided in 1937. The net total of Navy Estimates, 1938 is therefore £93,707,000, compared with £78,065,000 in 1937, an increase of £15,642,000.

The policy underlying the Navy Estimates is that laid down in the White Papers published on 3rd March, 1936, Cmd. 5107 and 16th February, 1937, Cmd. 5374. The provision now asked for in consequence of this policy includes the maintenance of the Fleet and ancillary services, the repair of deficiencies and progress on the building of war vessels already authorised, but contains nothing on account of the New Construction Programme for 1938, details of which are contained in another White Paper. A Supplementary Estimate will be presented in due course for so much of the work on that Programme as will fall to be carried out in the forthcoming financial year.

The figures for new construction, that is, expenditure on vessels belonging to the 1937 and earlier programmes, show an increase over the new construction provision last year of £7,895,375. This is indicative of the good progress which is being made in the large building programmes of 1936 and 1937. Another large increase is to be found in the provision for maintenance, repair and manning of the Fleet, which is £9,120,925 larger than the provision made for these services in 1937. Among the factors contributing to this increase are a much bigger volume of dockyard work on large repairs, including modernisation of capital ships, and a rise in the prices of materials. An increase of £1,598,000 in the provision for the Fleet Air Arm, excluding the cost of aircraft for new construction, is due partly to the maintenance of a larger first line strength and the provision of reserves, and partly to the transfer to Navy Votes from Air Votes of certain services, arising out of the decision of H.M. Government last year to transfer the administration of the Fleet Air Arm to the control of the Admiralty. There is a very small increase in non-effective services, £27,700.

As in previous years, allowance has been made for anticipated underspending in contract work.

DUFF COOPER.

ADMIRALTY,
28th February, 1938.

NOTES ON MATTERS OF GENERAL INTEREST.

FLEET MOVEMENTS IN CONNECTION WITH THE CORONATION OF HIS MAJESTY KING GEORGE VI.

The Home Fleet paid a visit to the River Thames during the Coronation period, and in common with the Home Ports Commands sent units of officers and men to London for the Coronation.

The greater part of the Mediterranean Fleet returned to Home waters, and was present, with the Home and Reserve Fleets and other units in Home waters, at the Coronation Naval Review at Spithead on the 20th May. The New Zealand Division of the Royal Navy, the Royal Canadian Navy, and the Royal Indian Navy were also represented, and the total number of H.M. Ships at the Review was 141. A large gathering of merchant vessels of many different types added to the representative nature of the Review, and 17 foreign warships were also present.

Their Majesties were escorted down the River Thames from Westminster to Greenwich by a flotilla of motor torpedo boats on the occasion of the opening of the National Maritime Museum on the 27th April.

H.M. Ships Southampton and Newcastle and the 5th Destroyer Flotilla escorted the Royal Yacht from Stranraer to Belfast and back on the occasion of Their Majesties' visit to Northern Ireland at the end of July.

NAVAL TREATIES.

Reference was made in the statement accompanying the Navy Estimates for 1937 to the signature of the London Naval Treaty (1936) by the United States, France and this country and the ratification of the Treaty by the first named power. On the 24th June last the Treaty was ratified by France and on the 29th July by Great Britain and the Dominions concerned. On the 4th November similar treaties between Great Britain and Germany and Great Britain and Russia were ratified.

Negotiations for similar treaties with Denmark, Finland, Norway, Poland, Sweden and Turkey are making satisfactory progress. In July certain minor points arising out of the Anglo-German Naval Agreement (1935) were discussed between the two Governments and satisfactorily settled, the decisions being recorded in a declaration attached to the bilateral treaty referred to above.

DISTRIBUTION OF THE FLEET.

The distribution of ships has in the main been normal except in the Mediterranean, where Fleet movements have necessarily been governed to a great extent by the fact of the Spanish Civil War.

For a long time a detachment of the Home Fleet was also required on the north coast of Spain, and the putting into force of the Nyon Arrangement and Paris Agreement entailed the use at times of Home Fleet units in the Mediterranean in order to free the Mediterranean Fleet ships for periodical training and rest.

BATTLESHIPS AND BATTLE CRUISERS.

The Warspite, after undergoing reconstruction, and carrying out a series of trials, has proceeded to the Mediterranean to replace the Queen Elizabeth as fleet flagship.

The Malaya rejoined the Mediterranean Fleet in May after completion of repairs due to damage sustained in collision.

AIRCRAFT CARRIERS.

The Furious has continued in the duties of training carrier, working partly with the Home Fleet and also independently as necessary for her special duties.

The Eagle relieved the smaller carrier Hermes in China in April, the latter returning to Home waters and reducing to Reserve after taking part in the Coronation Review.

CRUISERS.

Home Station.

The Southampton, Newcastle, Sheffield and Glasgow joined the 2nd Cruiser Squadron during 1937.

The Aurora relieved Cairo as the ship of Commodore (D).

The Cornwall became a training ship for boys during January 1938.

The Despatch and Delhi returned to the United Kingdom in December, 1937, and February, 1938, respectively, to join the Reserve Fleet.

America and West Indies Station.

The Orion joined the 8th Cruiser Squadron to relieve the Dragon which returned to the United Kingdom and entered the Reserve.

Africa Station.

The Neptune joined the 6th Cruiser Squadron relieving the Carlisle which returned to the United Kingdom and entered the Reserve.

It is intended that the Milford shall call at Tristan de Cunha with stores next month on her way out to the Africa Station.

China Station.

The Kent will shortly return to the China Station on completion of large repairs.

The Danae, on relief by the Dorsetshire, returned to the United Kingdom at the end of 1937, and joined the Reserve Fleet.

The Berwick returned to the United Kingdom in July, 1937, to carry out large repairs.

The Birmingham is on passage to join the 5th Cruiser Squadron in China.

East Indies Station.

The Manchester and the Liverpool on completion will relieve the Enterprise and the Emerald on the East Indies Station. It is intended that Enterprise shall on return to the United Kingdom carry out a trooping trip to China. Emerald will join the Reserve Fleet on relief.

New Zealand Division of the Royal Navy.

The Dunedin was relieved by the Leander in the spring of 1937.

LEADERS AND DESTROYERS.

The " Intrepid " class joined the Mediterranean Fleet in the place of the " Acasta " class which have been placed in Reserve and on subsidiary duties.

The Thanet is about to join the Hong Kong Local Defence Division, and the Tenedos and Scout will be placed in Reserve at Singapore.

The " Tribal " class destroyers of the 1935 and 1936 programmes are expected to join the Mediterranean and Home Fleets respectively in the course of the next twelve months.

SUBMARINES.

The minelaying submarine Rorqual, in company with the minelaying submarine Grampus, proceeded to the China Station, where in August, 1937, they relieved the submarines Oswald and Osiris, which have since returned to the United Kingdom.

The Sunfish has been completed, and has joined the 5th Submarine Flotilla at home.

The Sterlet on completion will join the 5th Submarine Flotilla at home.

The Undine, the first vessel of a new small type, will on completion join the 5th Submarine Flotilla.

The sister ships Unity and Ursula will join the 6th Submarine Flotilla at Portland on completion.

The Triton, Thetis, Triumph, Tribune and Trident, new oversea patrol type vessels, will join the 5th Submarine Flotilla on completion.

SUBMARINE DEPOT SHIP.

The Maidstone on completion will relieve the Cyclops as depot ship of the 1st Submarine Flotilla in the Mediterranean.

ESCORT VESSELS.

The Hastings joined the Fishery Protection Flotilla as the ship of the Captain F.P. & M. in May, 1937, in place of the Harebell.

The Fleetwood will proceed to the Red Sea next month to relieve the Londonderry.

The Londonderry will, on relief, proceed to the Africa Station to relieve the Penzance, which will then return home to join the Fishery Protection Flotilla in May, 1938, in the place of the Lupin.

The Bittern will join the 1st Anti-Submarine Flotilla on completion.

The Egret on completion will relieve the Weston in the Red Sea.

PATROL VESSELS.

The Sheldrake relieved the Kingfisher in July, 1937, as a ship of the Fishery Protection Flotilla employed in Scottish waters. The Kingfisher then relieved the Dart on Fishery Protection duties in the English Channel.

It is intended that the Sheldrake and Kingfisher shall join the 1st Anti-Submarine Flotilla, replacing two old destroyers. These two patrol vessels will replace two old destroyers in the Anti-Submarine Flotilla.

The Widgeon on completion will relieve P.C.74 in the 1st Anti-Submarine Flotilla.

MINESWEEPERS.

The Hazard, Hebe and Sharpshooter have relieved older vessels in the 1st Minesweeping Flotilla.

The Gossamer on completion will relieve the patrol vessel Sheldrake, as the ship of the Fishery Protection Flotilla employed in Scottish waters.

The Leda on completion will relieve the trawler Cherwell in the Fishery Protection Flotilla.

The Seagull will relieve an older vessel of the 1st Minesweeping Flotilla when she completes.

Seven minesweepers were sent to Malta to replace those sent to Singapore in 1937. Of these, four are now stationed at Alexandria. It is intended to complete the flotilla in the Mediterranean by sending three more minesweepers from the United Kingdom in the near future.

SURVEYING SHIPS.

The new surveying ship Gleaner will, on completion, replace the Beaufort on surveying duties in home waters.

The Jason and the Franklin, on completion, will relieve the Flinders and the Kellett on surveying duties in home waters.

The Scott will, on completion, similarly relieve the Fitzroy.

MISCELLANEOUS.

The trawler Lilac will relieve the patrol vessel Kingfisher on Fishery Protection Duties.

The minelayer Plover relieved the Medea as tender to the Vernon in September 1937.

The minelayer Linnet will on completion, become tender to the Vernon.

The cable ship Lassoo will on completion, become tender to the Anti-Submarine School.

The trawler Mastiff, on completion, will relieve the Foyle in the Fishery Protection Flotilla.

The two motor minesweepers of the 1936 programme, on completion, will join the 6th Minesweeping Flotilla at Portland.

The minelayer Redstart will relieve the trawler Vernon as tender to the Establishment Vernon.

The sister ship Ringdove of the same programme will proceed to Hong Kong in 1938.

The Submarine School tender Dwarf, on completion in March, 1937, was placed in service as tender to the Submarine School at Portsmouth.

The sailing yacht Tai Mo Shan was in commission throughout the summer, and was employed in training young officers and ratings in sail. She competed in several ocean races during the season.

CO-OPERATION WITH THE DOMINIONS, ETC.

The Imperial Conference afforded an opportunity for the discussion of measures of naval defence with representatives of the Dominions. The conclusions of the Conference were laid before the House in the form of a Summary of Proceedings in June, 1937.

COMMONWEALTH OF AUSTRALIA.

It has been a matter of great regret that it has not been possible for the Royal Navy to be represented at the recent celebrations commemorating the 150th anniversary of the founding of Australia. It is hoped, however, that one of H.M. Ships will be able to visit Sydney for the celebrations in April.

DOMINION OF CANADA.

During the past year ships of the Royal Canadian Navy have visited Bermuda and West Indian ports.

DOMINION OF NEW ZEALAND.

The ships of the Division and the two escort vessels of the Royal Navy have carried out exercises in company.

INDIA.

The escort vessels Lawrence, Clive and Hindustan carried out exercises based on Aden from June to August, 1937. The escort vessel Indus was attached for training to the 1st Minesweeping Flotilla during 1937.

Royal Indian Naval units have taken part in the recent combined operations in the vicinity of Singapore.

COLONIES.

Certain of the Colonies (Straits Settlements, Nigeria, Barbados and Fiji) have made generous contributions toward Imperial Defence during 1937 from which Navy Votes have derived benefit.

R.N.V.R. forces in the colonies continue to make good progress and steps have been taken to establish forces in Ceylon and Nigeria.

FLEET ACTIVITIES.

MEDITERRANEAN.

During the past year the Spanish civil war has necessitated the maintenance of a large number of ships in various parts of the Mediterranean for the protection of trade and British interests.

Until the Nyon patrol arrangements came into force two or three capital ships or cruisers and one flotilla of destroyers were maintained in the vicinity of the Mediterranean coast of Spain. On the 12th April the Hood and the Shropshire joined the division of destroyers on the Biscay coast of Spain, and from the 26th April, when the Hood was withdrawn, until the 1st November, one capital ship or cruiser and a division of destroyers were maintained there.

The Non-Intervention Sea Observation Scheme came into force on the 20th April, and a further heavy commitment was thus involved in the patrol of the portions of the Spanish coast which fell within the British zones. This patrol was carried out until the 16th September.

Whilst carrying out these duties the Hunter was damaged by a mine off Almeria on the 13th May with regrettable loss of life, eight members of the ship's company being killed and 14 injured. The fact that in spite of extensive damage the ship did not founder is a high tribute to the construction of our present-day destroyers.

The Nyon Arrangement was signed on the 14th September, and on the 20th September the anti-submarine patrol was commenced in the Western Mediterranean.

On the 1st October the Cyclops arrived at Arzeu, having embarked R.A.F. stores and Headquarters Wing at Gibraltar, to act as base for 209 and 210 Flying Boat Squadrons. The Cyclops continued this duty until the 15th December.

The measures taken were immediately successful in stopping for the time being piratical attacks by submarines on merchant ships and three months later it was found possible to reduce the ships immediately available for patrol in the Western Mediterranean to one destroyer flotilla, with two cruisers in the vicinity of the Balearic Islands for protection of trade. A recent recrudescence of piratical activity has been met by the strengthening of the patrol and, in conjunction with the Governments of France and Italy, by the issue of instructions that submarines found submerged in certain areas for which the three Powers are responsible in the Western Mediterranean under the Nyon and Paris Arrangements will be attacked and, if possible, destroyed. These measures have so far proved efficacious.

In order to carry out the duties in the Ægean Sea under the Nyon Arrangement, a force of one capital ship for operating Fleet Air Arm aircraft, and four destroyers, was maintained until the 15th December, when it was reduced to two destroyers.

H.M. Hospital ship Maine was engaged in evacuating refugees from the coast of Spain from the beginning of March, 1937, until 12th June, for the whole of July, and from 20th September to end of October. Since first commencing refugee work in July, 1936, this ship has carried 6,574 refugees of 41 different nationalities, and has steamed 20,996 miles in connection with these duties.

Fresh disturbances in Palestine necessitated the despatch of the Repulse to Haifa from 7th to 27th July. A smaller unit was maintained at that port until 2nd October, when the Active sailed with deportees, landing them at Seychelles on the 11th October.

The Delhi and the Despatch paid an official visit to Istanbul from the 2nd to 7th September.

During the same month, three ships of the 3rd Destroyer Flotilla visited Roumania, staying at Galatz from 8th to 15th.

The French Commander-in-Chief paid an official visit to Malta from the 9th to 11th November.

PERSIAN GULF.

H.H. The Sultan of Muscat was conveyed from Muscat to Sur and back in the Fowey.

The escort vessels stationed in these waters continued their normal work of anti-slavery patrols, maintaining our treaty obligations with Arab Sheikhs, and assisting the political officers in visiting their areas.

RED SEA.

H.R.H. The Emir Saud and his suite were conveyed from Jedda to Suez on their way to attend the Coronation in England.

The usual patrols have been carried out.

AMERICA AND WEST INDIES.

In June, 1937, serious rioting broke out in the oil-fields at Trinidad. Following a request from the Governor, the Commodore, South America Division, in the Exeter, and the Aajx were despatched to stand by. The Exeter remained at Trinidad for about a fortnight, visiting Tobago on one day on account of expected riots there.

The Ajax remained at Trinidad for about three weeks and then sailed for the United Kingdom.

The Apollo arrived at Trinidad about the middle of July, 1937, proceeding thence to Barbados.

All these ships landed seamen and marine platoons to assist in keeping order.

Later at the end of October, further rioting broke out at Trinidad, and the York was sent to assist in restoring order, remaining for nearly three weeks.

The Apollo conveyed the body of the late Rt. Hon. J. Ramsay MacDonald from Bermuda to Devonport at the end of November. The Apollo returned to the America and West Indies Station after giving five days' leave to the crew.

The Commodore Commanding South America Division in the Exeter attended the unveiling of the Canning Memorial at Buenos Aires in December, 1937.

CHINA.

Since the outbreak of the Sino-Japanese dispute H.M. ships have been employed on duties in connection with the protection of British nationals and interests.

At Shanghai landing parties from the ships of the fleet assisted the military forces in their duties during the earlier stages of the emergency.

Later the evacuation of women and children was largely organised by the naval authorities in conjunction with the Consul-General, and H.M. ships were used for conveying those evacuated to liners lying outside the danger area.

H.M. ships have also been stationed at other ports where danger to British nationals and interests has threatened.

On the Yangtse and West Rivers the gunboat flotillas have carried out similar duties.

The Capetown, which was for a period unable to leave the Yangtse due to a boom across the river, regained the open sea in December.

The Royal Navy has received with gratification an expression of the appreciation of the United States Government for the assistance rendered by H.M. ships to the survivors of the U.S. gunboat Panay.

AFRICA.

The normal cruises have been carried out by the cruisers and escort vessels on this station, and the Carlisle paid a visit to Tristan da Cunha in March, 1937.

FISHERY PROTECTION.

The work of the Fishery Protection and Minesweeping Flotilla in protecting and assisting the fishing fleets, and in training officers and men of the Reserves in minesweeping has been continued.

As an example of assistance afforded to the fishing fleets, Captain F.P. & M. in Harebell, with Kingfisher and Boyne, carried out an extensive search in very bad weather conditions for the missing trawler Amethyst, in the early part of 1937. The search took place in the northern part of the North Sea, and as far as the Faroes and in the direction of Iceland. Unfortunately no signs of the vessel were found.

During the past year the Captain Commanding Fishery Protection Flotilla, and vessels under his command, visited ports in Belgium, Denmark, Faroes, France, Germany, Holland and Iceland.

PROTECTION OF SHIPPING.

Plans for the protection of shipping in time of war have been constantly under review during the past year. In this work the Admiralty have been greatly assisted by the collaboration of the Board of Trade and of the shipping interests through the medium of the Shipping Defence Advisory Committee, the formation of which was reported to the House in the First Lord's statement accompanying the Navy Estimates for 1937.

One of the most important results of the Committee's work has been the institution of defence courses for officers of the Merchant Navy other than Royal Naval Reserve Officers at London, Liverpool, Southampton, Glasgow, South Shields, Cardiff and Hull. The object of these courses is to instruct Merchant Navy Officers in the measures to be taken in time of war to avoid dangers to their ships. The response has been very satisfactory, and up to the middle of February last 2,580 officers had attended the courses since their institution on 30th August. Of that number 2,121 had completed the course of instruction.

HYDROGRAPHY.

During 1937 H.M. Surveying Ships have been employed in making new surveys or re-surveys as necessary, the number of ships so engaged being three at home and four abroad. Of the latter, one has been employed in the Far East, one in the East Indies, one in New Zealand and one in the West Indies.

A detached unit based at Tayvallich carried out surveying duties on the west coast of Scotland.

The tidal stream survey of the British Isles in which the French Hydrographic Office is collaborating has been continued and satisfactory progress made.

The Hydrographer of the Navy presided at the Fourth International Hydrographic Conference which was held at Monaco from 13th–22nd April, and also attended the Assembly of the International Council for the Exploration of the Sea, which was held at Copenhagen from 5th–10th July.

The Hydrographers of Denmark, France, and the United States visited and were shown over the Hydrographic Department of the Admiralty and discussed technical questions of importance : in general, transactions with foreign hydrographic offices all over the world have been on a very friendly footing.

Training in hydrographic surveying has been given to officers of the Royal Australian, the Chinese and Royal Siamese Navies, and of the Nigerian Marine.

METEOROLOGY.

During the year the organisation of meteorological work in the Fleet has been under review and a new Admiralty branch has been established in charge of a Chief Superintendent under the Hydrographer of the Navy.

The branch is responsible for much of the work which used to be done by the Naval Division, Meteorological Office, Air Ministry. That division has now ceased to exist.

NAVIGATION.

The provision of H.M. ships with modern aids to navigation continues to receive close attention.

The equipment with echo-sounding apparatus of H.M. ships generally has made satisfactory progress.

Advance has also been made in the preparation of new and shorter methods for working out celestial observations.

The new regulations for preventing collisions at sea, and the international agreement for a uniform system of maritime buoyage, have not yet been brought into force.

FLEET TRAINING.

Owing to the international situation which has necessitated abnormal dispositions of ships, tactical training on a large scale by the Home and Mediterranean Fleets and of the China Squadron has been curtailed. Every opportunity has, however, been taken to exercise ships in their tactical functions.

An important exercise was carried out in the summer of 1937 by certain units of the Home Fleet, in co-operation with flying boats of the Royal Air Force, in the western approaches to the English Channel to investigate the vital problem of trade protection.

This exercise lasted seven days and, apart from providing an opportunity for officers to exercise their initiative, resulted in much valuable information and experience being gained.

CO-OPERATION BETWEEN THE SERVICES.

As in the preceding year, the many duties which the Navy has been called upon to perform has rendered it impossible to carry out many exercises in conjunction with the other two services. Combined exercises both at home and abroad have, however, been carried out with the object of practising troops in landing and of testing the defences of ports. A coast defence exercise also took place, which afforded very useful experience in matters of co-operation between the three services.

The usual exercises between the Staff Colleges of the three services have taken place.

Opportunity has been taken to practise certain squadrons of the R.A.F. in locating and attacking H.M. ships.

FLEET AIR ARM.

In accordance with the decision of H.M. Government as announced in the House of Commons on the 30th July, 1937, the responsibility for the administration of the Fleet Air Arm, i.e. of all ship-borne aircraft, is to be transferred from the Air Ministry to the Admiralty. Responsibility for research, experiment, development and supply of aircraft and equipment, however, still rests with the Air Ministry.

The method of effecting the transfer from the Air Ministry of those functions for which the Admiralty will in future be responsible is being examined in conjunction with the former Department.

There will be a considerable increase in the numbers of naval personnel engaged upon air duties, as the R.A.F. personnel at present engaged in the Fleet Air Arm are in due course to be replaced by R.N. personnel. In addition, further personnel will have to be provided to meet the requirements of the expansion programme of the Fleet Air Arm, which will entail a substantial increase in the numbers of aircraft. The methods of providing this personnel are under consideration. It is hoped that it will prove practicable to transfer officers and airmen from the Royal Air Force to the Royal Navy, as well as to retain the services of R.A.F. personnel in the Fleet Air Arm until R.N. personnel can be provided in the requisite numbers to replace them.

It has been decided that the Air Ministry shall remain responsible for the training of pilots for the Fleet Air Arm up to the stage where specialisation in naval duties begins, when the Admiralty will assume responsibility, and the necessary administrative arrangements to give effect to this decision are in preparation.

The modifications in Admiralty organisation required by the new responsibilities which will fall upon the Department have been settled, and are being put into effect. The new post of Assistant Chief of the Naval Staff (Air) has been instituted in order that a member of the Board of Admiralty may be able to devote his whole attention to air matters.

It has been decided that a new department to deal with air material and another to deal with air personnel will be necessary. The directors of these departments have been appointed, and nucleus staffs are being provided. The two departments will be further developed as necessary as progress with the reorganisation proceeds.

Navy Votes (Vote 4) will in the financial year 1938 bear expenditure on prototype aircraft and training, which has hitherto been borne by Air Votes.

PERSONNEL.

Entries of cadets into the R.N. College, Dartmouth, have remained at 45 per term and the number of special entry cadets, executive, continues to be approximately 33 per term. The decision to allow a certain number of Royal Naval Reserve Officers to transfer to the Royal Navy (Supplementary list) has resulted in the acceptance of 125 officers during the current year.

The reorganisation of the Royal Naval College, Dartmouth, referred to in the statement accompanying Navy Estimates, 1937, has been carried out and reports upon the working of the new house system are at present entirely satisfactory.

Recruiting for the Royal Navy and Royal Marines has been very satisfactory and with few exceptions has succeeded in meeting greatly increased requirements. The entry of boys between the ages of 16½ and 17½ years on special service engagements has been particularly successful both in the quantity and in the quality of recruits.

One of the most formidable problems which has to be met owing to the rapid expansion of the Royal Navy is the provision of proper training, and the rapid increase in the number of officers and men required, together with the preoccupations of the Fleet due to the international situation have thrown a considerable strain on training arrangements both afloat and ashore. The technical schools and training establishments ashore are full to capacity with the exception of H.M.S. Caledonia, commissioned in April last as a boys' and artificer apprentices' training establishment. The provision of this vessel has proved of material assistance in enabling increased numbers to be accommodated and trained, and this also applies to the Wildfire, sub-depot at Sheerness, where special service boys are trained. The training of seamen boys has been transferred from the Royal Sovereign (battleship) to the Cornwall (cruiser) in the Home Fleet and one Reserve Fleet cruiser at each home port is also being utilised for this purpose.

In view of the reduced time now spent in the rank of midshipman, training in engineering duties has been reduced from two months to one month. The general education course for acting sub-lieutenants previously held at the Royal Naval College, Greenwich, was temporarily suspended in 1937 in order to meet increased requirements at sea. The course will be started again at the first available opportunity.

Promotion for naval ratings continues to be rapid both in the substantive and non-substantive rates.

During 1937 the scheme for promotion to sub-lieutenant from the lower deck has been simplified. It was considered that to qualify for the final selection board under the original scheme, the educational and technical standards required were too difficult for ratings to attain when, at the same time, they had to carry out their normal duties. Under the new scheme ratings selected by the Fleet boards are all sent to one ship for a nine months' course under special instructional officers. On completion of this course ratings are required to pass examinations of the old standard in school and technical subjects and those successful go before the final selection board. Selected candidates join the R.N. College, Greenwich, as acting sub-lieutenants for a further course. Unsuccessful candidates either take the course for warrant officer or are sent back to sea as petty officers. The first class of 31 began this course in H.M.S. Ramillies on the 8th November and the scheme is developing most satisfactorily.

The first review of service conditions which was begun in all commands in September and October, 1936, is now nearing completion. The new system which extends to all ships as well as to shore establishments has proved satisfactory and has enabled the Admiralty to make a number of improvements in conditions of service on the lower deck. Improvements affecting the lower deck generally include an increase in the scale of leave for foreign service and in the scale of leave for men serving in harbour ships and shore establishments in England and Wales, and approval for chief petty officers and petty officers to wear plain clothes, if they wish, when they go on leave from or return to shore establishments at home, and for all ratings to wear plain clothes, if they wish, on long leave.

Among the improved amenities being generally embodied in ships of new construction are larger and better recreational spaces for ratings, better equipped bathrooms and special facilities for the washing of clothes. In addition, conditions of service in H.M. Ships, particularly in hot climates, are being improved by the extension of the supply of domestic automatic refrigerators.

As from 1st July, 1937, 1 oz. of butter has been provided in place of 1 oz. of margarine in the daily ration of naval ratings.

In spite of transfers to the Royal Navy and an increase in the establishment of the Royal Naval Reserve, the number of R.N.R. officers is maintained at a satisfactory level. Recruiting for the Patrol Service R.N.R. is also good.

Recruiting for the R.N.V.R. has increased and a signal school will be started in Chrysanthemum when she joins the London Division. Members of the Royal Naval

Volunteer Supplementary Reserve are showing keenness in undergoing classes of instruction to prepare themselves for naval training in the event of mobilisation.

MATERIAL. NEW CONSTRUCTION.

BATTLESHIPS.

1936 *Programme.*

Work on the King George V and the Prince of Wales, laid down on 1st January, 1937, is proceeding satisfactorily at the works of Messrs. Vickers-Armstrongs, Ltd., Walker-on-Tyne, and Messrs. Cammell Laird & Co., Ltd., Birkenhead, respectively.

1937 *Programme.*

The Anson, Jellicoe and Beatty, three battleships of the " King George V " class, were ordered from Messrs. John Brown & Co., Ltd., Messrs. Swan, Hunter and Wigham Richardson, Ltd., and Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., respectively. The keels were laid on 5th May, 20th July and 1st June, 1937, respectively.

AIRCRAFT CARRIERS.

1934 *Programme.*

The Ark Royal, under construction by Messrs. Cammell Laird & Co., Ltd., was launched on 13th April, 1937, and is expected to complete during the summer of 1938.

1936 *Programme.*

The Illustrious and Victorious, under construction by Messrs. Vickers-Armstrongs, Ltd., were laid down, the former at Barrow-in-Furness on 27th April, 1937, and the latter at High Walker on 4th May, 1937.

1937 *Programme.*

Two further aircraft carriers of a standard displacement of 23,000 tons, have been ordered, the Formidable from Messrs. Harland & Wolff, Ltd., Belfast, on 19th March, 1937, and the Indomitable from Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness, on 6th July, 1937. The keel of the Formidable was laid on 17th June, and that of the Indomitable on 10th November, 1937.

CRUISERS.

1933 *Programme.*

The Newcastle and Southampton, the first two ships of the " Southampton " class, were completed at the works of Messrs. Vickers-Armstrongs, Ltd., and Messrs. John Brown & Co., Ltd., respectively, in March, 1937.

1934 *Programme.*

The Aurora, the fourth and last cruiser of the " Arethusa " class, was completed at Portsmouth in November, 1937.

The Sheffield and Glasgow, of the " Southampton " class, were completed at the works of Messrs. Vickers-Armstrongs, Ltd., and Messrs. Scotts' Shipbuilding and Engineering Co., Ltd., respectively, the former on 25th August and the latter on 9th September, 1937. The Birmingham, of the same class, completed at Devonport on 18th November, 1937.

1935 *Programme.*

The Liverpool, Manchester and Gloucester, of the " Southampton " class, are progressing satisfactorily with a view to completion in the financial year 1938. The Liverpool, building at the works of Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., was launched on the 24th March, 1937 ; the Manchester, under construction by Messrs. Hawthorn Leslie & Co., Ltd., on the 12th April, 1937 ; and the Gloucester, building at Devonport Dockyard, on the 19th October, 1937.

1936 *Programme.*

Construction of the two improved " Southampton " class cruisers, Belfast and Edinburgh, is progressing satisfactorily. The Edinburgh, under construction by Messrs. Swan, Hunter and Wigham Richardson, Ltd., and the Belfast, by Messrs. Harland & Wolff, Ltd., Belfast, are expected to be launched next month.

Orders have been placed for five cruisers of the " Dido " class, 5,450 tons standard displacement. The Dido, building by Messrs. Cammell Laird & Co., Ltd., was laid down on 20th October ; the Naiad, building by Messrs. Hawthorn, Leslie & Co., Ltd., on 26th August, and the Phœbe, building by Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., on 2nd September, 1937.

The Euryalus was laid down at Chatham Dockyard on 21st October, 1937, and the Sirius is expected to be laid down at Portsmouth Dockyard in April, 1938.

1937 *Programme.*

Orders for five cruisers of the " Fiji " class, 8,000 tons standard displacement, were place in December, 1937, as follows :—

Fiji	Messrs. John Brown & Co., Ltd., Clydebank.
Kenya	Messrs. Alexander, Stephen & Sons, Ltd., Govan.
Mauritius	Messrs. Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne.
Nigeria	Messrs. Vickers-Armstrongs, Ltd., High Walker, Newcastle-on-Tyne.
Trinidad	H.M. Dockyard, Devonport.

Orders were placed on the 20th March, 1937, for the Hermione of the " Dido " class with Messrs. Alexander, Stephen & Sons, Ltd., Govan, and for the Bonaventure of the same class with Messrs. Scotts' Shipbuilding Engineering Co., Ltd., Greenock. The keels were laid on the 6th October and 30th August, 1937, respectively.

LEADERS AND DESTROYERS.

1935 *Programme.*

The flotilla leader Inglefield and the eight destroyers of the " Intrepid " class were completed during the period May, 1937–January, 1938.

The construction of the " Tribal " class destroyers, Afridi, Cossack, Gurkha, Maori, Mohawk, Nubian and Zulu, is proceeding satisfactorily.

1936 *Programme.*

The construction of the Ashanti, Bedouin, Eskimo, Mashona, Matabele, Punjabi, Sikh, Somali and Tartar, nine further destroyers of the " Tribal " class, is proceeding satisfactorily.

1936 *and* 1937 *Programmes.*

Orders for the following ships were placed on the 25th March, 1937 :—

Jervis and Kelly .. (leaders)	Messrs. Hawthorn, Leslie & Co., Ltd., Hebburn-on-Tyne.
Jackal and Kashmir	Messrs. John Brown & Co., Ltd., Clydebank.
Jaguar and Kandahar	Messrs. Wm. Denny & Bros., Ltd., Dumbarton.
Jamaica and Kelvin	Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., Govan.
Janus and Khartoum	Messrs. Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne.
Javelin and Kimberley.	Messrs. J. I. Thornycroft & Co., Ltd., Southampton.
Jersey and Kingston	Messrs. J. S. White & Co., Ltd., Cowes.
Jupiter and Kipling	Messrs. Yarrow & Co., Ltd., Scotstoun.

Orders will shortly be placed for the remaining eight destroyers of the 1937 programme (" Laforey " class).

SUBMARINES.

1933 *Programme.*

The minelayer submarine Grampus was completed at Chatham Dockyard in March, 1937.

1934 *Programme.*

The Sunfish, of the " Swordfish " class, was completed at Chatham Dockyard in July, 1937.

1935 *Programme.*

The Sterlet, the last of the " Swordfish " class, under construction at Chatham Dockyard, is expected to complete in April, 1938.

The minelayer submarine Cachalot, of the "Porpoise" class, under construction at the works of Messrs. Scotts' Shipbuilding and Engineering Co., Ltd., is expected to complete in June, 1938.

The Triton, the first of the new class of patrol submarines, under construction at Messrs. Vickers-Armstrongs, Ltd., is expected to complete about June, 1938.

1936 *Programme.*

Construction of the minelayer submarine Seal, laid down at Chatham Dockyard in December, 1936, is progressing satisfactorily.

Work is proceeding normally on the four submarines of the "Triton" class, viz.:—

Thetis laid down on 21st December, 1936, by Messrs. Cammell Laird & Co., Ltd.
Trident laid down on 12th January, 1937, by Messrs. Cammell Laird & Co., Ltd.
Tribune laid down on the 3rd March, 1937, by Messrs. Scotts' Shipbuilding and Engineering Co., Ltd.
Triumph laid down on 19th March, 1937, by Messrs. Vickers-Armstrongs, Ltd.

The three small submarines of the "Unity" class—Unity, Undine and Ursula—are expected to complete at the works of Messrs. Vickers-Armstrongs, Ltd., before the end of 1938.

1937 *Programme.*

Further vessels of the "Triton" class have been ordered as follows:—

In July, 1937:—

Thistle	Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness. (Keel laid 7th December, 1937.)
Taku	Messrs. Cammell Laird & Co., Ltd., Birkenhead. (Keel laid 18th November, 1937.)
Tarpon	Messrs. Scotts' Shipbuilding and Engineering Co., Ltd., Greenock. (Keel laid 5th October, 1937.)

In December, 1937:—

Truant and Triad	Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness.
Tuna	Messrs. Scotts' Shipbuilding and Engineering Co., Ltd., Greenock.
Tigris	Chatham Dockyard.

ESCORT VESSELS.

1935 *Programme.*

The Bittern, under construction by Messrs. J. S. White & Co., Cowes, is due to complete next month.

1936 *Programme.*

The Egret, ordered from Messrs. J. S. White & Co., Ltd., Cowes, in March, 1937, is expected to be completed about November, 1938.

The Auckland (originally Heron), ordered from Messrs. Wm. Denny & Bros., Ltd., Dumbarton, on 5th March, 1937, is expected to be delivered about November, 1938.

1937 *Programme.*

The Pelican was ordered from Messrs. J. I. Thornycroft & Co., Ltd., Southampton, on 19th March, 1937, and is expected to complete about December, 1938.

The Black Swan and Flamingo were ordered from Messrs. Yarrow & Co., Ltd., Scotstoun, on 1st January, 1938.

MINESWEEPERS.

1935 *Programme.*

The Hazard was completed by Messrs. W. Gray & Co., Ltd., in November, 1937, and the Hebe and Sharpshooter at Devonport Dockyard in October and December, 1937, respectively.

The Gleaner, under construction by Messrs. W. Gray & Co., Ltd., is being fitted for surveying duties and should complete next month.

1936 *Programme.*

The Leda and Seagull are progressing satisfactorily at Devonport Dockyard, and are expected to complete in the summer of 1938.

The Gossamer, under construction by Messrs. W. Hamilton & Co., Ltd., Port Glasgow, should complete next month.

The Jason, which is being fitted for surveying duties, is expected to be delivered by Messrs. The Ailsa Shipbuilding Co., Ltd., Troon, in April, 1938.

1937 *Programme.*

The Bramble and Britomart were laid down at Devonport Dockyard on 22nd November, 1937, and 1st January, 1938, respectively, and the Speedy and Sphinx at the works of Messrs. W. Hamilton & Co., Ltd., Port Glasgow, on 1st December, 1937, and 17th January, 1938, respectively.

PATROL VESSELS.

1935 *Programme.*

The Kittiwake and Sheldrake were completed by Messrs. J. I. Thornycroft & Co., Ltd., in April and July, 1937, respectively.

1936 *Programme.*

The Widgeon, building by Messrs. Yarrow & Co., Ltd., Scotstoun, is expected to complete during the coming summer.

1937 *Programme.*

The Guillemot, Pintail and Shearwater will be ordered shortly.

DEPOT SHIPS.

The submarine depot ship Maidstone (1935 programme), under construction by Messrs. John Brown & Co., Ltd., Clydebank, is due for delivery in May, 1938.

The submarine depot ship Forth (1937 programme), ordered in April, 1937, from the same firm, was laid down in the following June.

The destroyer depot ship Tyne (1937 programme) will be ordered shortly.

OTHER VESSELS.

The Franklin, surveying vessel (1936 programme), under construction by Messrs. The Ailsa Shipbuilding Co., Ltd., is expected to be completed in June, 1938. A similar vessel, the Scott (1937 programme), ordered from Messrs. The Caledon Shipbuilding and Engineering Co., Ltd., Dundee, on 12th April, 1937, is due to complete in October, 1938.

The river gunboat Scorpion (1936 programme), under construction by Messrs. J. S. White & Co., Ltd., Cowes, is due to complete before the end of the summer.

Two similar vessels, the Dragonfly and Grasshopper (1937 programme), were ordered from Messrs. J. I. Thornycroft & Co., Ltd., Southampton, in August, 1937, and were laid down on 29th December, 1937.

Construction of the magnetic survey vessel Research (1935 programme) is being advanced by Messrs. Philip & Son, Ltd., Dartmouth. Some difficulty is being experienced in obtaining supply of suitable non-magnetic material for the crank shaft.

The boom defence vessel Dunnet (1934 programme) was completed by Messrs. The Lytham Shipbuilding Co., Ltd., in May, 1937.

Seventeen boom defence vessels ("Barricade" class) are under construction and are due to complete in 1938. These comprise two vessels of the 1935 programme, five of the 1936 programme and ten of the 1937 programme, orders for which have been allocated as follows :—

Barricade (1935) Barrier (1935)	Messrs. Charles Hill & Sons, Ltd., Bristol.
Barbarian (1936) Barbette (1936) Barbican (1936) Barbrook (1937) Barcastle (1937)	Messrs. The Blyth Dry Docks and Shipbuilding Co., Ltd., Blyth.
Barrage (1936) Barranca (1936)	Messrs. Hall, Russell & Co., Ltd., Aberdeen.
Barcombe (1937) Barcroft (1937)	Messrs. The Goole Shipbuilding and Repairing Co., Ltd., Goole.

Barfair (1937) Barfield (1937)	Messrs. John Lewis & Sons, Ltd., Aberdeen.
Barlane (1937) Barlight (1937)	Messrs. Lobnitz & Co., Ltd., Renfrew.
Barlow (1937) Barmouth (1937)	Messrs. Wm. Simons & Co., Ltd., Renfrew.

The remaining six boom defence vessels of the 1937 programme ("Bayonet" class) have recently been ordered as follows:—

Bayonet Falconet	Messrs. The Blyth Dry Docks and Shipbuilding Co., Ltd., Blyth.
Magnet Martinet	Messrs. Smith's Dock Co., Ltd., Middlesbrough.
Planet Plantagenet	Messrs. Lobnitz & Co., Ltd., Renfrew.

The trawler Mastiff (1936 programme) is expected to be completed by Messrs. Henry Robb, Ltd., Leith, in May, 1938.

The cable ship Lassoo (1936 programme), building by Messrs. J. I. Thornycroft & Co., Ltd., Southampton, is expected to complete in May, 1938.

The minelayer Linnet (1936 programme), building by Messrs. The Ardrossan Dockyard, Ltd., should complete in May, 1938. The minelayers Redstart and Ringdove (1937 programme), ordered from Messrs. Henry Robb, Ltd., Leith, in March, 1937, were laid down in September, and the vessels are expected to complete in the course of the next few months.

The tugs Brigand and Buccaneer (1936 programme) were completed by Messrs. Fleming & Ferguson, Ltd., Paisley, in January and February, 1938, respectively. The Bandit (1937 programme), ordered from the same firm in March, 1937, was laid down in July, 1937, and completes in April, 1938.

The minelayer Plover (1935 programme) was completed by Messrs. Wm. Denny & Bros., Ltd., in September, 1937.

The Dwarf, Submarine School tender (1934 programme) was completed by Messrs. Philip & Son, Ltd., Dartmouth, in March, 1937.

Three motor torpedo boats (1936 programme) have been completed by the British Power Boat Company, and the remaining boats ordered under this programme are expected to be completed shortly. Nine motor torpedo boats of the 1937 programme have been ordered from the British Power Boat Company, and the tenth vessel of this programme has been purchased from Messrs. Vosper, Ltd.

The motor torpedo boat of special design (1936 programme), under construction by Messrs. J. S. White & Co., Ltd., Cowes, should be completed at an early date.

The two motor minesweepers (1936 programme) under construction by Messrs. J. I. Thornycroft & Co., Ltd., are expected to be completed shortly.

The conversion of the Vulcan (late trawler Aston Villa) has been completed by Messrs. Smith's Dock Co., Ltd., and the vessel is on service as a seagoing tender for motor torpedo boats.

The Moorland, a new mooring vessel for Sheerness Dockyard, of the 1937 programme, was ordered from Messrs. W. Simons & Co., Ltd., Renfrew, in September, 1937, and is due to complete in August, 1938.

The Wave, combined water tank vessel and tug for Hong Kong (1937 programme) will be built locally.

LARGE REPAIRS.

The reconstruction of the Warspite at Portsmouth has been completed. Difficulties arose during sea trials owing to the interaction of the propellers.

Work on the Renown at Portsmouth is proceeding satisfactorily.

The Valiant was taken in hand at Devonport on 1st March, 1937, and the Queen Elizabeth at Portsmouth on 11th August. The work on each vessel includes the installation of new machinery and boilers.

The Argus, in hand at Devonport for large repairs and fitting for aircraft training services, will be completed during the summer of 1938.

The Effingham in hand at Devonport for large repairs and re-arming, is also expected to complete during the summer of 1938.

The Vindictive was completed at Portsmouth in July, 1937, and is on service as a cadets' training ship.

The Cornwall was completed in December, 1937, at Chatham for service as a boys' seagoing training ship.

The Hunter, damaged by mine, was taken in hand at Gibraltar for temporary repairs, and later at Malta for permanent repairs, and the work is expected to be completed in the latter part of 1938.

NAVAL WORKS.

Apart from the provision of a new W/T Station at Trincomalee, a new residence and offices for the Commander-in-Chief, Mediterranean, at Malta, a new explosive factory, passive defence and protective measures against air attack at Naval Establishments and oil-fuelling depots at home and abroad respectively, the major new works in the 1938 Estimates consist almost exclusively of dockyard items at home.

The augmented shipbuilding programme and the necessity for preserving a proper balance of work between the dockyards has made it necessary to increase the existing dock accommodation at Chatham dockyard and provision is included in the 1938 Estimates for the extension of No. 6 dock by about 160 feet. At Plymouth provision is made for additional permanent storage accommodation by the transfer from the War Office to the Admiralty of the gunwharf. This will necessitate the re-provision of suitable accommodation elsewhere for the War Department the cost of which will be borne upon Navy Votes.

There are several items in H.M. Dockyard, Portsmouth, the principal of which is the provision of additional electrical workshops, the present facilities being quite inadequate to meet the growing needs of the Fleet. Among other items at Portsmouth is the provision of a mechanical training establishment on shore to replace the hulk Sultan. This new building is the only alternative to an immediate expenditure on the hulk of £8,000 for repair which would very soon become nugatory owing to the rapid deterioration of the hulk.

The graving dock at Singapore was officially opened on the 14th February by the Governor of the Straits Settlements and named the King George VI Dock. The erection of dockyard workshops, stores and offices is proceeding and a proportion of the workshops are structurally complete. Work upon other items of the naval base are proceeding in accordance with expectations and the main portions of the base will be completed by March, 1939.

MISCELLANEOUS.

Close contact has been maintained with the liaison committee on steel supplies for the defence departments which was set up during the year, with the result that urgent cases of shortage of steel for H.M. vessels under construction have been met. An Admiralty Steel Office has been opened in Newcastle for the purpose of ordering structural materials for the dockyards. This has enabled very much better delivery of such material to be secured.

The results obtained in the application of electric welding to ship construction have continued to be satisfactory, as was exemplified by the way in which the destroyer Hunter withstood the explosion of a mine. The Seagull, a minesweeper of the 1936 programme, launched at Devonport in October, 1937, is completely welded as to structure.

Experiments to ascertain the effect of various aerial weapons upon war vessels and the best method of mitigating their damaging effect have been continued.

Experimental work on armour has proceeded in collaboration with the armour firms.

BOILERS.

Important advances have been made during the current year in obtaining higher outputs from a given weight of boiler. Following investigations at the Admiralty Fuel Experimental Station, Haslar, and shore trials of an Admiralty type boiler, further experience of operation at high rates of forcing is being obtained under sea-going conditions. Opportunity is being taken as far as practicable to embody in current designs established advances in this respect.

In addition, further exploratory work on promising alternative designs is being carried out both ashore and afloat.

TURBINES.

Investigation into the performance of ships recently on trials has led to modifications which will improve economy at cruising powers without appreciably prejudicing economy at the highest powers.

INTERNAL COMBUSTION ENGINES.

The new type of submarine engine which has been on service since June, 1937, has given satisfactory results and in consequence development work on a larger engine of this type has been advanced. The unit engine has run satisfactory shop tests.

A high-powered high-speed engine suitable for use in motor torpedo craft is being developed.

AUXILIARY MACHINERY.

Every opportunity has been taken to gain experience with promising alternative types of auxiliary machinery units, both with a view to utilising the best available designs, and to the widening of the field of supply.

ARMAMENT.

Research and experimental work on gun armament material continues, new designs have been completed and improved and economical methods of fighting the gun armament introduced. Steady progress in augmenting the anti-aircraft armament of the Fleet has been maintained. New sources of supply have been arranged and equipped.

ABSTRACT OF NAVY ESTIMATES FOR 1938.

Votes.		Estimates 1938.*		Estimates 1937.
		Gross Estimate.	Net Estimate.	Net Estimate.
	I.—NUMBERS.		Maximum Numbers.	Maximum Numbers.
A	Number of Officers, Seamen, Boys, and Royal Marines	119,000	119,000	112,000
	Number of Royal Marine Police	913	913	895
	II.—EFFECTIVE SERVICES.	£	£	£
1	Wages, etc., of Officers and Men of the Royal Navy, and Royal Marines, and Civilians employed on Fleet Services	15,052,220	15,027,000	14,181,000
2	Victualling and Clothing for the Navy	5,166,990	4,421,000	3,978,000
3	Medical Establishments and Services	513,150	441,000	411,400
4	Fleet Air Arm	5,718,000	5,718,000	4,200,000
5	Educational Services	299,760	223,600	207,500
6	Scientific Services	766,880	656,000	586,000
7	Royal Naval Reserves	355,990	355,800	373,300
8	Shipbuilding, Repairs, Maintenance, etc.*:			
	Section I.—*Personnel*	10,138,220	10,094,000	8,583,000
	Section II.—*Matériel*	15,146,450	11,045,100	8,878,700
	Section III.—Contract Work	38,996,708	19,742,000	14,662,800
9	Naval Armaments*	16,235,800	10,392,000	7,769,700
10	Works, Buildings, and Repairs at Home and Abroad	5,468,000	2,317,000	2,093,000
11	Miscellaneous Effective Services	1,869,970	1,775,300	812,600
12	Admiralty Office	1,609,130	1,602,500	1,459,000
	Total Effective Services £	117,337,268	83,810,300	68,196,000
	III.—NON-EFFECTIVE SERVICES.			
13	Naval and Marine, Officers	3,065,841	3,049,000	3,174,000
14	Naval and Marine, Men	5,568,000	5,485,500	5,386,000
15	Civil Superannuation, Compensation Allowances, and Gratuities	1,364,910	1,362,200	1,309,000
	Total Non-Effective Services £	9,998,751	9,896,700	9,869,000
	GRAND TOTAL £	127,336,019	93,707,000†	78,065,000

NET INCREASE* . . . . . £15,642,000.

ADMIRALTY,
18 *Feb.*, 1938.

DUFF COOPER,
CHATFIELD,
M. E. DUNBAR-NASMITH,

R. G. H. HENDERSON,
G. S. ARBUTHNOT,
W. M. JAMES,
J. H. D. CUNNINGHAM,

G. H. SHAKESPEARE,
J. J. LLEWELLIN,
R. H. A. CARTER.

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* Excluding provision required for New Shipbuilding Programme for 1938, for which a Supplementary Estimate will be presented.

† The Appropriation-in-Aid include sums aggregating £30,000,000 to be provided by issues from the Consolidated Fund under the Defence Loans Act, 1937. The net total of Navy Estimates before deducting sums to be received from this source is £123,707,000. The comparable figures in Navy Estimates were £27,000,000 and £105,065,000 respectively.

STATEMENT SHOWING THE NUMBERS BORNE, THE EXPENDITURE ON NAVAL SERVICES FOR THE YEARS 1918 TO 1936, AND THE ESTIMATES FOR 1937 AND 1938.

Year	Vote A. — Average numbers borne. (a)	Vote 1. — Wages, &c., of Officers, &c	Vote 2. — Victualling and Clothing.	Vote 3. — Medical Establishments, &c.	Vote 4. — Fleet Air Arm.	Vote 5. — Educational Services.	Vote 6. — Scientific Services.	Vote 7. — Royal Naval Reserves.	Vote 8. — Shipbuilding, Repairs, Maintenance, &c.			Vote 9. — Naval Armaments.	Vote 10. — Works.	Vote 11. — Miscellaneous.	Vote 12. — Admiralty Office.	Vote 13. — Half Pay, &c.	Vote 14. — Naval, &c., Pensions.	Vote 15. — Civil Superannuation, &c.	Balances Irrecoverable	Total Expenditure
									Section I. Personnel.	Section II. Matériel.	Section III. Contract Work.									
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1918	381,311	46,373,511	24,219,351	1,158,287	491,270	247,922	262,886	871,970	15,037,763	59,128,675	94,248,874	64,866,784	10,928,241	9,357,532	1,985,894	704,914	3,733,778	445,485	28,090	334,091,227
1919	176,087	32,385,306	8,823,106	733,046	556,778	401,864	364,832	458,044	12,426,177	*Credit :—* *785,986*	48,348,933	14,441,835	5,595,608	11,118,631	2,042,715	1,176,937	15,133,064	802,279	60,875	154,084,044
1920	124,009	21,314,360	8,311,708	683,830	759,110	503,152	249,185	359,694	12,096,747	6,799,965	12,001,445	8,493,951	4,992,969	5,724,974	2,073,764	2,352,344	4,847,475	880,996	23,611	92,505,290
1921	127,180	19,220,859	6,831,481	643,735	480,243	405,592	359,575	423,056	10,690,188	8,835,771	4,834,336	6,253,468	4,746,485	3,506,514	1,780,641	2,002,201	3,881,368	1,020,693	69,935	75,986,141
																Non-effective Services.				
																Officers.	Men.			
1922	107,782	15,762,232	4,767,118	492,419	258,600	382,065	354,961	423,722	7,075,533	3,877,716	3,225,598	3,678,783	3,553,831	2,096,219	1,371,961	3,701,984	5,471,088	968,880	29,679	57,492,389
1923	99,107	14,175,111	4,153,803	410,842	193,793	330,644	379,489	459,391	6,751,496	5,521,336	4,427,874	3,840,606	3,215,766	982,173	1,247,813	2,856,764	4,260,245	823,340	33,864	54,064,350
1924	99,453	14,150,863	4,152,902	442,756	190,669	334,648	393,054	446,902	7,489,659	5,592,183	5,415,210	3,507,190	3,140,887	1,065,869	1,349,519	2,868,798	4,328,526	811,797	12,355	55,693,787
1925	100,284	14,576,499	4,226,570	440,209	Fleet Air Arm (b) 1,320,000	327,226	417,552	465,114	7,929,259	6,905,184	6,395,406	4,247,113	2,422,050	826,119	1,307,790	2,812,336	4,449,585	928,326	8,110	60,004,548
1926	100,791	14,322,678	4,236,846	434,919	681,000	324,036	393,339	444,759	7,487,952	5,422,141	7,275,173	3,595,037	2,108,441	930,369	1,203,639	2,914,419	4,450,140	894,472	23,002	57,142,862
1927	101,916	14,568,462	4,182,491	423,777	882,000	224,334	402,976	419,086	7,067,419	4,678,052	8,839,423	3,996,749	1,900,788	844,852	1,233,132	2,966,485	4,525,353	965,602	2,276	58,123,257
1928	100,680	14,435,347	3,992,639	418,863	1,008,300	226,486	396,298	403,295	6,743,571	5,074,290	8,263,060	3,871,235	1,950,207	728,841	1,181,125	3,006,321	4,496,310	944,735	4,223	57,139,146
1929	99,300	14,286,313	3,840,098	419,371	1,066,000	226,449	467,343	387,241	6,561,827	4,977,230	7,291,217	3,868,359	2,079,775	725,511	1,194,842	3,075,856	4,550,155	968,944	1,239	55,987,770
1930	94,921	13,996,225	3,531,280	394,505	1,267,000	224,722	470,965	395,648	6,227,647	4,198,553	5,532,728	3,557,624	1,928,639	667,107	1,178,675	3,121,672	4,592,970	983,198	5,033	52,274,186
1931	92,449	13,432,777	3,145,731	379,239	1,126,000	219,367	451,498	394,007	6,331,341	4,517,054	4,717,751	3,326,274	2,399,570	683,774	1,114,266	3,123,312	4,625,833	1,026,306	652	51,014,752
1932	89,667	12,636,077	2,980,931	361,229	1,025,000	207,142	453,149	346,552	6,262,431	4,190,785	5,429,049	3,318,886	2,374,150	562,029	1,086,182	3,125,419	4,741,854	1,060,833	2,455	50,164,453
1933	89,863	12,514,488	3,182,430	376,228	1,089,000	194,742	454,819	373,092	6,192,587	4,351,666	7,905,227	3,767,355	2,243,564	572,722	1,079,214	3,231,172	4,857,822	1,055,710	1,707	53,443,545
1934	91,351	12,688,561	3,146,979	366,069	1,338,000	194,079	455,883	342,052	6,527,160	4,763,966	9,638,067	4,034,459	2,068,310	553,411	1,105,578	3,260,867	5,008,397	1,122,976	1,196	56,616,010
1935	94,259	13,139,921	3,434,985	405,758	1,993,000	198,962	465,666	334,151	7,173,391	6,451,208	12,159,366	5,657,513	2,050,025	789,112	1,155,355	3,181,493	5,102,079	1,173,312	22,316	64,887,613
1936	99,886	13,693,059	3,575,440	399,872	3,572,000	205,873	496,176	329,978	8,002,951	9,325,302	17,850,481	8,628,627	3,092,290	846,994	1,306,636	3,159,145	5,262,135	1,220,067	9,098	80,976,124
1937 (estimate)	112,000(b)	14,181,000	3, 978,000	411,400	4,200,000	207,500	586,000	373,300	8,583,000	8,878,700	14,662,800	7,769,700	2,093,000	812,600	1,459,000	3,174,000	5,386,000	1,303,000	—	78,065,000
1938 (estimate)	119,000(b)	15,027,000	4,421,000	441,000	5,718,000	223,600	656,000	355,800	10,094,000	11,045,100	19,742,000	10,392,000	2,317,000	1,775,300	1,602,500	3,049,000	5,485,500	1,362,200	—	93,707,000†

Note.—The figures for Expenditure represent the Net Expenditure after taking into account receipts noted in the Navy Appropriation Accounts as receipts in excess of estimated Appropriations in Aid.

(*a*) Exclusive of Royal Marine Police. **(*b*) Maximum bearing.**

† See note † on previous page.

EXPENDITURE FOR NAVAL PURPOSES OF THE PRINCIPAL FOREIGN POWERS.

UNITED STATES NAVY.

Summary of estimates of appropriations for the fiscal year 1938, compared with the fiscal year 1937.

Bureau or subdivision.	Appropriations 1938.	Appropriations 1937.
Bureau of Aeronautics	$44,558,800	$49,858,800
Marine Corps	27,668,580	26,581,213
Replacement Navy, Construction and Machinery	117,363,150	90,000,000
Armour and Armament	20,700,000	40,000,000
Bureau of Supplies and Accounts	224,811,350	207,546,275
Bureau of Medicine and Surgery	2,637,580	2,446,013
Bureau of Yards and Docks	19,613,600	14,834,758
Bureau of Engineering	24,944,400	22,388,200
Bureau of Construction and Repair	21,892,069	19,805,979
Bureau of Ordnance	26,998,600	24,603,800
Bureau of Navigation	14,174,935	14,505,370
Hydrographic Office, Navy Department	534,020	544,600
Naval Observatory	198,120	198,560
Office of Naval Records	46,080	54,080
Office of Judge Advocate-General	122,000	120,920
Office of Chief of Naval Operations	72,660	69,250
Office of Director of Naval Communications	135,200	130,000
Office of Naval Intelligence	79,180	72,250
Board of Inspection and Survey	19,840	19,840
Office of the Secretary	2,625,330	2,504,890
Total Trust Funds	1,523,000	1,570,650
Reappropriation	—	10,000,000
TOTAL	550,718,494	527,855,448

FRENCH NAVY.

ESTIMATES, 1938.

The figures for 1938, as compared with those for 1937 are as follows :—

	1938. *Francs.*	1937. *Francs.*
Ordinary (*i.e.* Maintenance)	2190,759,986	1810,748,180
Extraordinary (*i.e.* New Construction and Works)	2460,000,000	2649,531,518
TOTAL	4650,759,936	4460,279,698

The principal items included in the extraordinary vote are :—

	1938.	1937.
New Construction salaries	127,285,000	117,758,578
New construction by dockyards (material)	434,999,000	444,051,000
New construction by Private Firms	846,999,900	929,229,882
Naval Ordnance (material)	498,000,000	577,000,000
Naval Ordnance (Salaries)	57,500,000	56,500,000
Torpedoes and mines	98,000,000	72,000,000

ROYAL ITALIAN NAVY.

ESTIMATES, 1938–1939.

	1938–39. *Lire.*	1937–38. *Lire.*
TOTAL	2,013,000,000	1,857,890,000
The principal construction items are :—		
New Construction	603,000,000	608,000,000
Maintenance and Repairs . . .	145,500,000	120,500,000

JAPANESE NAVY.

ESTIMATES, 1937–38.

	Yen.
Ordinary	274,000,000
Extraordinary	407,000,000
TOTAL	681,000,000

No official figures are published for the German Naval Estimates.

BRITISH AND FOREIGN NAVIES.

PRINCIPAL OFFICIALS.

Great Britain.

First Lord.—The Right Hon. A. Duff-Cooper, D.S.O., M.P.

First Sea Lord and Chief of Naval Staff.—Admiral of the Fleet Lord Chatfield, G.C.B., K.C.M.G., C.V.O., D.C.L. (Oxon.).

Second Sea Lord and Chief of Naval Personnel.—Admiral Sir Martin E. Dunbar-Nasmith, V.C., K.C.B.

Third Sea Lord and Controller.—Vice-Admiral Sir Reginald G. H. Henderson, K.C.B.

Fourth Sea Lord and Chief of Supplies and Transport.—Rear-Admiral Geoffrey S. Arbuthnot, D.S.O.

Deputy Chief of Naval Staff.—Vice-Admiral Sir W. M. James, K.C.B.

Assistant Chief of Naval Staff (Air).—Rear-Admiral J. H. D. Cunningham, C.B., M.V.O.

Parliamentary and Financial Secretary.—Geoffrey Shakespeare, Esq., M.P.

Civil Lord.—Colonel J. J. Llewellin, O.B.E., M.C., T.D., M.P.

Permanent Secretary.—Sir R. H. Archibald Carter, K.C.B., K.C.I.E.

Foreign Powers.

Country.	Minister of Marine.	Chief of Staff.
Argentina	Rear-Admiral Eleazar Videla	Vice-Admiral Julián Fablet Captain Marcos Zar, C.B.E. (Director of Naval Aviation)
Brazil	Vice-Admiral Henrique Aristides Guilhem	Vice-Admiral Amphiloquio Reis Captain Adalberto Nunes (Director-General of Naval Aviation)
Chile	Don Emilio Codecido (National Defence)	Vice-Admiral Reyes del Rio (Director General of the Navy)
China		
Colombia		Rear-Admiral B. O. Bell-Salter
Cuba		
Denmark	A. E. Andersen (Minister of Defence)	Vice-Admiral H. Rechnitzer (Chief of Naval Defence) Commander A. E. V. Grandjean (Flying Service)
Ecuador	Colonel Benigno A. Flores (Minister of Defence).	—
Estonia	General Lill (Minister of Defence).	Captain W. Grentz (Commanding Naval Forces)
Finland	J. Niukkanen (Minister of Defence)	Lieutenant-General V. Öesterman (Chief of Army and Navy)
France	Mons. Campinchi	Vice-Admiral J. L. X. F. Darlan Rear-Admiral E. M. Lacroix (Head of Naval Air Service at Ministry of Marine)
Germany	General Keitel (Minister of War and C.-in-C. of the Defence Forces)	Admiral Dr. Raeder (Chief of Navy Department, Admiralty)
Greece	General Metaxas	Rear-Admiral A. Sakellariou
Hungary		Rear-Admiral O. R. Wulff (Inspector-General)
Italy	Signor Mussolini Admiral of the Fleet, D. Cavagnari (Under Secretary for the Navy)	Admiral of the Fleet, D. Cavagnari.
Japan	Vice-Admiral Mitsomasu Yonai, C.M.G.	Admiral of the Fleet Prince Hiroyasu Fushimi, G.C.V.O. Vice-Admiral K. Oikawa, M.V.O. (Director of Aviation)
Latvia	General Balodis (Minister of War)	Captain Spade (Chief of Naval Forces)
Lithuania	Colonel Stasys Dirmantas (Minister of National Defence)	—
Mexico		Rear-Admiral O. P. Blanco.
Netherlands	Mons Van Dijk	Rear-Admiral J. T. Fürstner.
Norway	C. F. Monsen (Minister of Defence)	Rear-Admiral E. Otto (Commanding Admiral) Commodore H. E. Bruusgaard (Naval Air Service)
Paraguay	(Minister of National Defence)	Commander Manuel Aponte
Persia		Lieut.-Colonel Ghulam Ali Khan Bayendor (in command of Flotilla)
Peru	Captain Roeque Saldiás (Minister of Marine and Aviation)	Captain Frederico Diaz Dulanto

Countries.	Minister of Marine.	Chief of Staff.
Poland	Marshal Smigley-Rydz (Inspector-General of the Armed Forces)	Rear Admiral J. Swirsky (Chief of Navy Department)
Portugal	Lieut.-Colonel Manuel Ortins Bettencourt	Vice-Admiral Joaquim Anselmo da Matta Oliveira (Major-General and C.-in-C. of the Fleet) Lieut.-Commander Pedro Ferreiro Rosado (Director of Naval Aviation)
Roumania		Commander E. Rosca
Siam	Luang Bipal	Eng.-Captain Phya Vicharu Chakrakich (Acting C.-in-C.)
Spain		
Sweden	Janne Nilsson (Minister of Defence)	Vice-Admiral Ch. de Champs (Chief of the Navy) Lieut.-General T. Friis (Chief of Air Force)
Turkey	Captain Said (Under Secretary for the Navy)	Vacant
United States	C. Swanson (Secretary of the Navy)	Admiral W. D. Leahy (Chief of Naval Operations)
Uruguay	General Domingo Mendivie (Minister of War and Marine)	Rear-Admiral Arturo Juambeltz (Inspector General of Marine and S.N.O. afloat)
U.S.S.R.	Marshal K. E. Voroshilov (Commissar of Defence)	— (Deputy Commissar for Defence (Naval)) Acksnis (Chief of the Air Forces)
Venezuela	Commander Larazaval (Head of the Navy)	Vice-Admiral M. L. Polić (C.-in-C. of the Navy)
Yugoslavia	Army General Lj. M. Marić (Army and Navy Ministry)	Captain I. Preradović (Naval Air Force)

BRITISH AND FOREIGN NAVAL ATTACHÉS.

To :—

Albania and Italy : Naval Attaché, Captain R. H. Bevan, R.N. (appointed 2nd August, 1936) ; Assistant Naval Attaché, Commander (E.) G. Hearson (appointed 22nd September, 1937) ; Headquarters, Rome.

Belgium, France, Netherlands, Portugal and Spain : Naval Attaché, Captain C. S. Holland (appointed 17th January, 1938) ; Assistant Naval Attaché Commander (E.) G. Hearson (appointed 22nd September, 1937) ; Headquarters, Paris.

Denmark, Esthonia, Finland, Germany, Latvia, Lithuania, Norway, Poland and Sweden : Naval Attaché, Captain T. H. Troubridge, R.N. (appointed 23rd July, 1936) ; Assistant Naval Attaché, Commander (E.) G. Hearson (and Assistant to Naval Attachés, Paris and Rome) ; Headquarters, Berlin.

Japan and China : Naval Attaché, Captain H. B. Rawlings, O.B.E., R.N. (appointed 3rd January, 1936) ; Assistant Naval Attaché, Commander (E.) A. D. Merriman, R.N. (appointed 5th May, 1936) ; Headquarters, Tokyo.

U.S.A., Cuba, Mexico, and Panama : Naval Attaché, Captain F. C. Bradley, R.N. (appointed 19th June, 1935) ; Assistant Naval Attaché, Commander (E.) F. J. A. Coleby (appointed 1st October, 1937) ; Headquarters, Washington, D.C.

South America, including the Argentine Republic, Brazil, Chile, Ecuador, Peru, and Uruguay : Naval Attaché, Captain P. J. Mack, R.N. (appointed 28th December, 1935) ; Headquarters, Buenos Aires.

Roumania and Bulgaria : Captain H. Clanchy (acting) (appointed 24th October, 1936) ; Headquarters, Moscow.

Siam : Naval Attaché, Commander A. D. Torlesse (appointed 1st January, 1937) ; Headquarters, Bangkok.

FOREIGN NAVAL ATTACHÉS ACCREDITED TO GREAT BRITAIN.

From :—

Argentine : Rear-Admiral Don Mario Fincati. Argentine Naval Commission : Rear-Admiral Don Mario Fincati, Commander Francisca Renta, Commander M. A. Parra, 171, Victoria Street, S.W.1.

Belgium : Lieutenant-General Baron Vincotte, C.V.O., D.S.O. (Military Attaché), Belgian Embassy, 103, Eaton Square, S.W.1.

Brazil : Engineer Captain Natal Arnaud, Brazilian Embassy, 19, Upper Brook Street, Mayfair, W.1.

Chili : Commander Don Gerald H. Trudgett, 76, Victoria Street, S.W.1. Chilian Naval Commission : Rear-Admiral C. Rogers, C.N. (retd.), 76, Victoria Street, S.W.1.

China : Captain Lung Yung Haien, Chinese Embassy, 49, Portland Place, W.1.

Denmark : Post Vacant.

Finland : Commander Holger Gröndahl, 37, Smith Square, Westminster, S.W.1.

France : Captain du Tour, French Embassy, Albert Gate House, S.W.1.; Assistant Naval Attaché, Lieutenant de Vaisseau Lionel Bedin.

Germany : Captain Leopold Siemens, German Embassy, 7, Carlton House Terrace, S.W.1.

Greece : Captain S. Matesis, c/o Greek Legation, London.

Italy : Rear-Admiral Bruno Brivonesi ; Assistant Naval Attaché, Lieut. (E.) Ernesto Trenchi, 4, Three Kings' Yard, Davies Street, W.1.

Japan : Captain Hideo Yano ; Assistant Naval Attachés, Commander S. Ashina, Lieutenant-Commander Taketoshi Suzuki, Broadway Court, Westminster, S.W.1.

Netherlands : Lieutenant-Commander A. de Booy, Netherlands Legation, 21A, Portman Square, W.1.

Norway : Post vacant.

Peru : Post vacant.

Poland : Post vacant.

Portugal : Post vacant.

Roumania : Capitaine de Vaisseau G. Dumitrescu. Assistant, Captain Gheorghe Iliescu, 4, Cromwell Place, S.W.7.

Soviet Union : Post vacant.

Spain : Commander Fernando Navarro Y. Capdevila, 24, Belgrave Square, S.W.1. Spanish Naval Commission : Commander Fernando Navarro Y. Capdevila, 64, Victoria Street, S.W.1.

Sweden : Commander G. E. F. Boldt-Christmas, Swedish Legation, 27, Portland Place, W.1.

Turkey : Capitaine de Corvette Rifat Ozdes, 69, Portland Place, W.1.

U.S.A. : Captain Russell Willson (and for Air), U.S.N. ; Assistant Naval Attachés Commander Gordon W. Nelson, U.S.N. (C.C.), Commander William Keen Harrill, U.S.N. (for Aviation), Lieut. Robert Lord Campbell, U.S.N., 4 Grosvenor Gardens, S.W.1.

Uruguay : Post vacant.

Yugoslavia : Brigadier General George S. Glischitch, Naval and Military Attaché, and Air Attaché, 195, Queen's Gate, S.W.7.

BRITISH SHIPBUILDING FIRMS.

The firms listed below all undertake the building of merchant vessels. Those which undertake in addition the construction of (*a*) Men-of-war, (*b*) Propelling machinery and (*c*) Auxiliary machinery for ships, are so distinguished.

Ailsa Shipbuilding Co., Ltd., Troon, Ayrshire. (*a*) (*b*)
Ardrossan Dockyard, Ltd., Ardrossan, Ayrshire.
S. P. Austin and Son, Ltd., Wear Dock Yard, Sunderland. (*a*)
Barclay, Curle and Co., Ltd., Whiteinch, Glasgow. (*a*) (*b*)
Bartram and Sons, Ltd., South Dock, Sunderland.
George Brown and Co., Greenock.
John Brown and Co., Clydebank. (*a*) (*b*)
Burntisland Shipbuilding Co., Ltd., Burntisland.
Caledon Shipbuilding and Engineering Co., Ltd., Dundee. (*a*) (*b*)
Cammell Laird and Co., Ltd., Birkenhead. (*a*) (*b*) (*c*)
Cochrane and Sons, Ltd., Selby, Yorks.
William Denny and Brothers, Ltd., Dumbarton. (*a*) (*b*)
William Doxford and Sons, Ltd., Sunderland. (*a*) (*b*)
Fairfield Shipbuilding and Engineering Co., Ltd., Govan, Glasgow. (*a*) (*b*)
Ferguson Brothers (Port Glasgow), Ltd., Port Glasgow. (*a*) (*b*) (*c*)
Fleming and Ferguson, Ltd., Paisley. (*b*)
Furness Shipbuilding Co., Ltd., Haverton-on-Tees.
Goole Shipbuilding and Repairing Co., Ltd., Goole. (*a*)
Grangemouth Dockyard Co., Ltd., Grangemouth.
William Gray and Co., Ltd., West Hartlepool. (*a*) (*b*) (*c*)
Greenock Dockyard Co., Ltd., Greenock.
Hall, Russell and Co., Ltd., Aberdeen. (*b*)
William Hamilton and Co., Ltd., Port Glasgow. (*a*)
Harland and Wolff, Ltd., Belfast and Govan, Glasgow. (*a*) (*b*) (*c*)
R. and W. Hawthorn, Leslie and Co., Ltd., Newcastle-on-Tyne. (*a*) (*b*) (*c*)
Charles Hill and Sons, Ltd., Bristol.
A. and J. Inglis, Ltd., Pointhouse, Glasgow. (*a*)
Irvine's Shipbuilding and Dry Docks Co., Ltd., Hartlepool. (*c*)
Sir James Laing and Sons, Ltd., Sunderland.
John Lewis and Sons, Ltd., Aberdeen. (*b*)
Lytham Shipbuilding and Engineering Co., Ltd., Lytham, Lancs. (*a*) (*b*)
Philip and Son, Ltd., Dartmouth. (*a*) (*b*)
Sir John Priestman and Co., Sunderland.
John Readhead and Sons, Ltd., South Shields. (*b*)

Henry Robb, Ltd., Leith. (*a*)
Rose Street Foundry and Engineering Co., Ltd., Inverness. (*b*) (*c*)
Scott and Sons, Bowling, near Glasgow.
Scotts' Shipbuilding and Engineering Co., Ltd., Greenock. (*a*) (*b*)
Short Brothers, Ltd., Sunderland.
William Simons and Co., Ltd., Renfrew, near Glasgow. (*a*) (*b*)
Smith's Dock Co., Ltd., North Shields. (*b*)
Alexander Stephen and Sons, Ltd., Linthouse, Govan, Glasgow. (*a*)
Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne. (*a*) (*b*) (*c*)
Joseph L. Thompson and Sons, Ltd., Sunderland.
John I. Thornycroft and Co., Ltd., Woolston, Southampton. (*a*) (*b*) (*c*)
Vickers-Armstrongs, Ltd., Barrow-in-Furness and High Walker, Newcastle-on-Tyne. (*a*) (*b*) (*c*)
J. Samuel White and Co., Ltd., Cowes, Isle of Wight. (*a*) (*b*) (*c*)
Wood, Skinner and Co., Ltd., Bill Quay, Pelaw, Co. Durham.
Yarrow and Co., Ltd., Scotstoun, Glasgow. (*a*) (*b*) (*c*)

BOAT-BUILDERS.

In addition to the shipbuilding firms listed above, the following firms undertake the construction of men-of-war's boats or power-driven boats for combatant purposes.

Aldous Successors, Ltd., Brightlingsea, Essex.
Boats and Cars (Kingston), Ltd., Kingston-on-Thames.
British Power Boat Company, Hythe, Southampton.
Brooke Motor Craft Co., Ltd., Harbour Road, Oulton Broad, Lowestoft.
Camper and Nicholson, Gosport.
Clare Lallow, Cowes, Isle of Wight.
Walter Cook, Maldon, Essex.
Groves and Guttridge, Clarence Road, Cowes, Isle of Wight.
Hamble River Yacht and Engineering Co., Swanwick Shore, near Southampton. (Now owned by Solent Shipyard Co., Ltd., Bursledon, Hants.)
Hugh McLean and Sons, Ferry Road, Renfrew.
Mechans, Ltd., Scotstoun Ironworks, Glasgow.
Medway Yacht Basin, Rochester.
J. H. Pounder and Co., Throston Bridge, Hartlepool.
Rowhedge Ironworks, Ltd., Rowhedge, near Colchester.
A. Rutherford and Co., Ltd., Birkenhead.
Saunders Roe, Ltd., Cowes, Isle of Wight.
Sittingbourne Shipbuilding Co., Ltd., 97, Park Road, Sittingbourne, Kent.
J. Taylor (Chertsey), Ltd., Chertsey, Surrey.
Vosper, Ltd., Portsmouth.
White's Southampton Yachtbuilding and Engineering Co., Ltd., Itchen, Southampton.

FIRMS MANUFACTURING MILITARY AIRCRAFT.

The following are the principal constructors of military aircraft:

Airspeed (1934), Ltd., The Airport, Portsmouth, Hants.
Sir W. G. Armstrong Whitworth Aircraft, Ltd., Whitley, near Coventry.
Blackburn Aircraft, Ltd., Brough, E. Yorks.
Boulton Paul Aircraft, Ltd., The Airport, Wolverhampton.
Bristol Aeroplane Co., Ltd., Filton, Bristol.
De Havilland Aircraft Co., Ltd., Hatfield Aerodrome, Hertfordshire.
Fairey Aviation Co., Ltd., Hayes, Middlesex.
The Gloster Aircraft Co., Ltd., 3, St. James's Square, S.W.1.
Handley Page, Ltd., 40, Claremont Road, Cricklewood, N.W.2.
Hawker Aircraft, Ltd., Canbury Park Road, Kingston-on-Thames.
Phillips and Powis Aircraft, Ltd., Reading Aerodrome, Woodley, Reading.
A. V. Roe and Co., Ltd., Newton Heath, Manchester.
Saunders-Roe, Ltd., East Cowes, Isle of Wight.
Short Bros. (Rochester and Bedford), Ltd., Rochester, Kent.
Supermarine Aviation Works (Vickers), Ltd., Vickers House, Broadway, Westminster, S.W.1.
Vickers (Aviation), Ltd., Weybridge, Surrey.
Westland Aircraft, Ltd., Yeovil, Somerset.

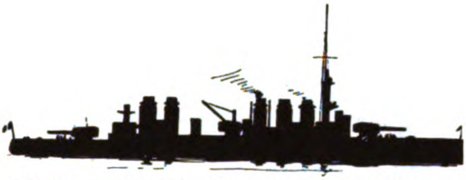
PROFILES OF
BRITISH AND FOREIGN WARSHIPS

1

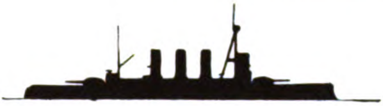
CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance **with the number of funnels and masts,** as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 217–258. All the profiles are drawn to the scale ½ in. = 100 ft.]

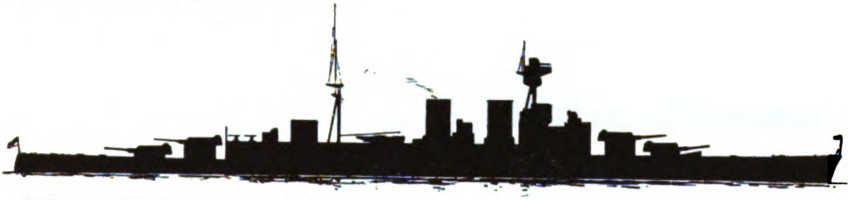
[Indexes to the names of vessels of which profiles are included in this section are given at the end of the volume.]



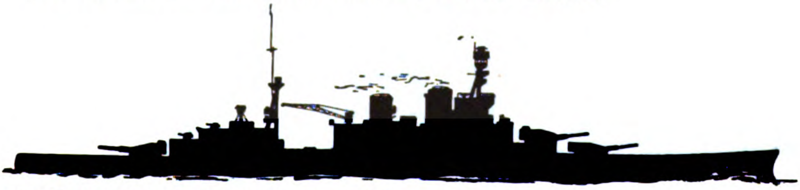
FRANCE. Battleships. Condorcet, Diderot, Voltaire.
(Diderot has a tall mainmast.)



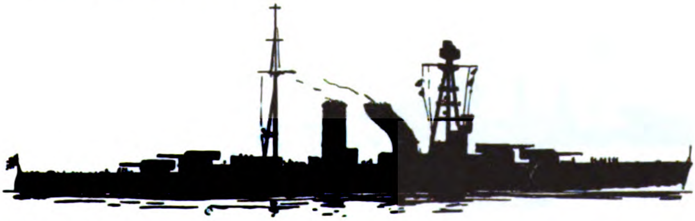
SWEDEN. Battleship. Oscar II.



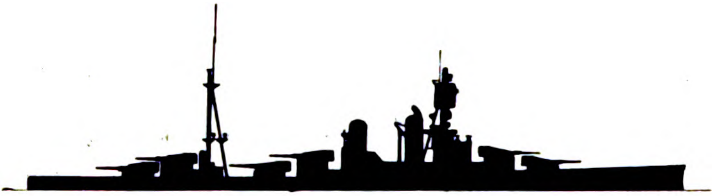
GREAT BRITAIN. Battle-cruiser. Hood.
(Fore topgallant mast has been added and bridge structure modified.)



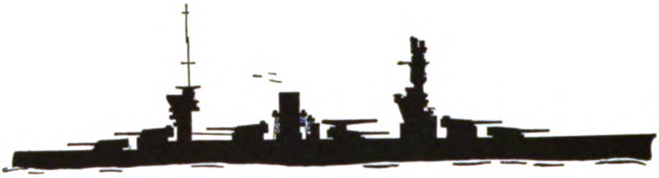
GREAT BRITAIN. Battle-cruiser. Repulse (after reconstruction 1936).
Renown now undergoing reconstruction will be similar.
Fore topmast removed.



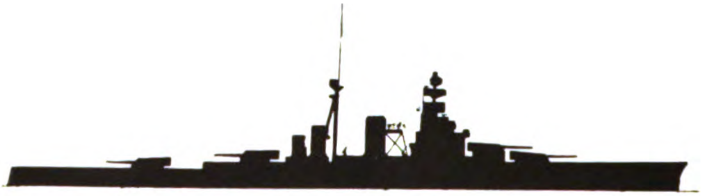
JAPAN. Battleships. Mutsu, Nagato.
Single funnel fitted and catapult added between mainmast and "X" turret.



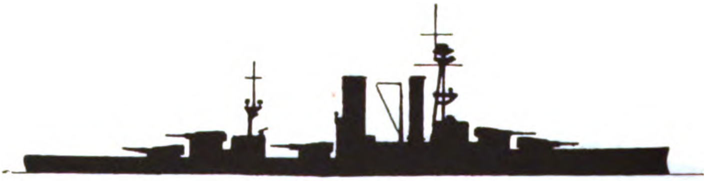
JAPAN. Battleships. Ise, Hyuga.
Fore topmast removed.



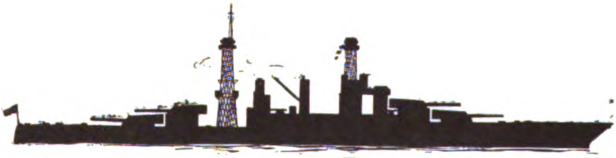
JAPAN. Battleships. Fuzo and Yamashiro.
(After reconstruction, 1934.)



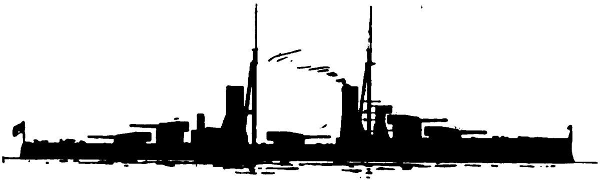
JAPAN. Battleships. Haruna, Kirishima, Kongo.



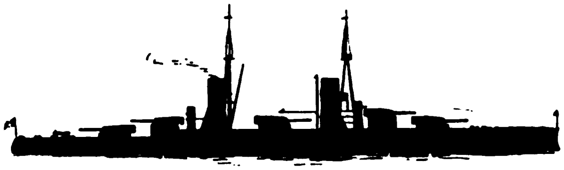
CHILE. Battleship. Almirante Latorre.
(Modernised 1931—mainmast raised and bridge work altered.)



UNITED STATES. Battleships. California, Colorado, Maryland, Tennessee, West Virginia.
(Now fitted with 2 catapults, one on "X" turret and one on the quarter deck.)
Crane fitted at stern.

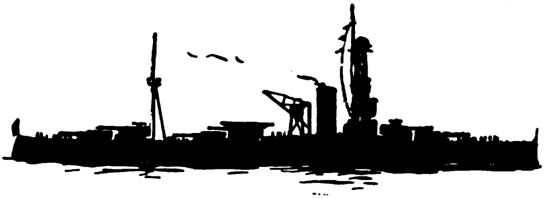


ITALY.* Battleships. Andrea Doria, Caio Duilio.

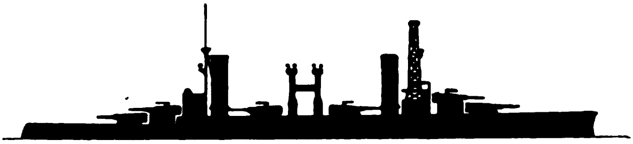


ITALY.* Battleships. Conte di Cavour, Giulio Cesare.

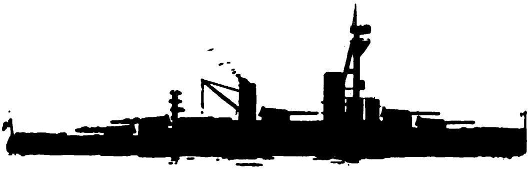
* NOTE.—The above 4 Italian battleships are being modernised. Bow is being lengthened by 36 ft., midships turret removed and 2 catapults fitted.



UNITED STATES. Battleship. Arkansas.



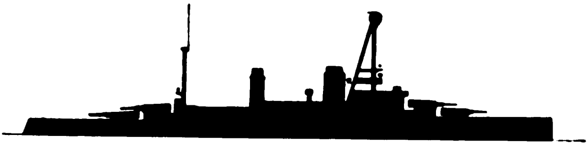
ARGENTINE. Battleships. Moreno, Rivadavia.



FRANCE. Battleships. Bretagne, Lorraine, Provence.

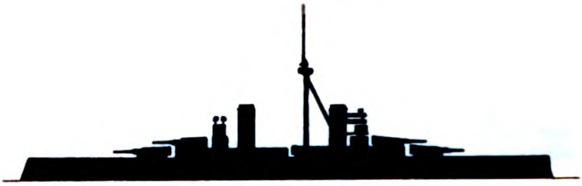
NOTE.—Lorraine has been modernised. The midships turret has been removed and replaced by a hangar.

Bretagne and Lorraine have main topmasts. Fore topmasts removed.

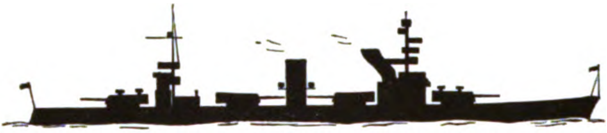


FRANCE. Battleships. Courbet, Paris.

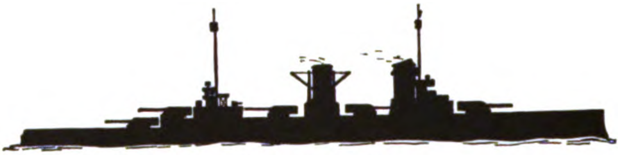
Cranes fitted abreast after funnel.



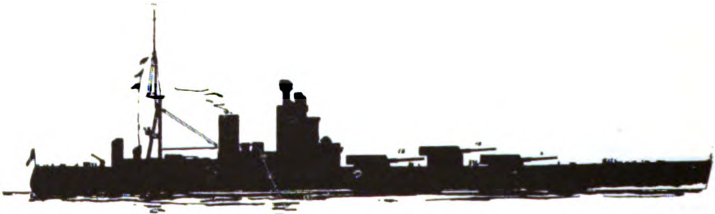
BRAZIL. Battleships. Minas Geraes, São Paulo.
Minas Geraes has forward funnel removed and bridgework modified.



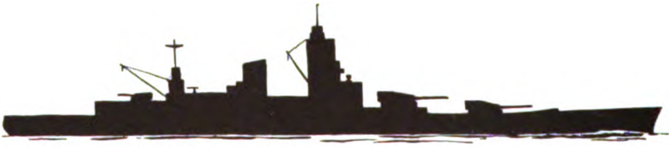
SOVIET UNION. Battleships. Marat and Paris Commune.



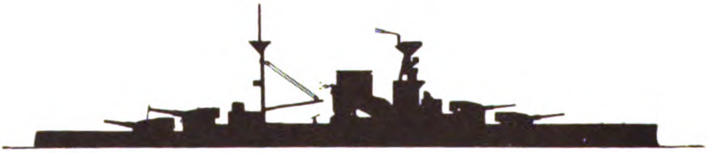
TURKEY. Battle-cruiser. Yavouz Sultan Selim.



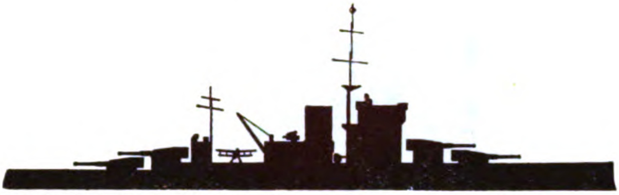
GREAT BRITAIN. Battleships. Nelson, Rodney.
Platform built on fore side of funnel.



FRANCE. Battleship. Dunkerque.

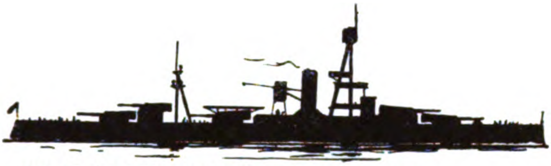


GREAT BRITAIN. Battleships. Barham, Malaya.
NOTE.—Barham has tripod mainmast and catapult on "X" turret.
Barham and Malaya have tall mainmasts and no fore topmasts.
Malaya has catapult before mainmast; Derrick on mainmast removed.



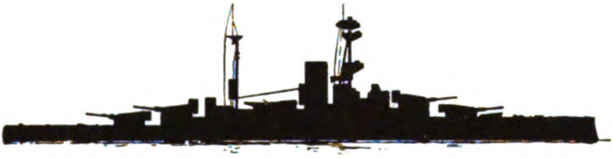
GREAT BRITAIN. Battleships. Warspite, Queen Elizabeth, Valiant.

NOTE.—Queen Elizabeth and Valiant have tripod foremasts and are under reconstruction.



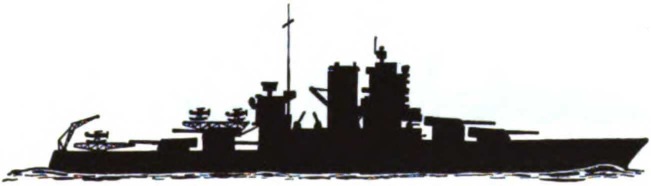
UNITED STATES. Battleships. New York, Texas.

Fore topmast removed and masthead modified.

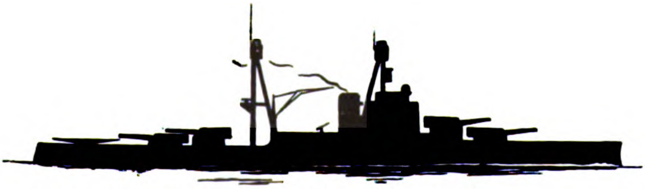


GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge, Royal Oak, Royal Sovereign.

NOTE.—Resolution has a smoke deflector on the funnel. Royal Oak, Ramillies and Resolution have a catapult on "X" turret and a crane abreast mainmast.

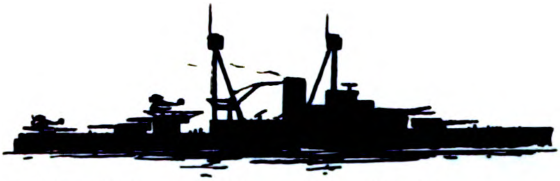


UNITED STATES. Battleships. Idaho, Mississippi. (After modernisation, 1934.)

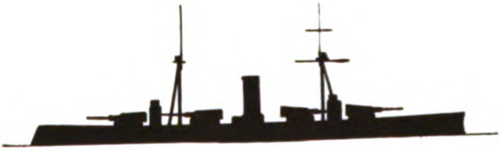


UNITED STATES. Battleships. Arizona, Pennsylvania.

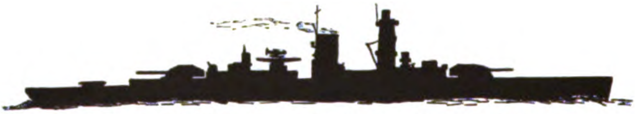
Catapult on "X" turret added. Crane fitted at Stern. Main topmast is on fore side of mast structure.



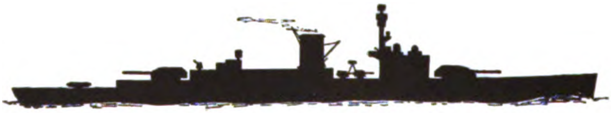
UNITED STATES. Battleships. Nevada, Oklahoma.



SPAIN. Battleship. Jaime I.
Fore topmast and yards removed from Jaime I.

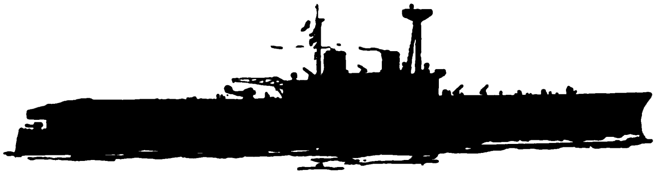


GERMANY. Armoured Ships. Admiral Scheer, Admiral Graf Spee.

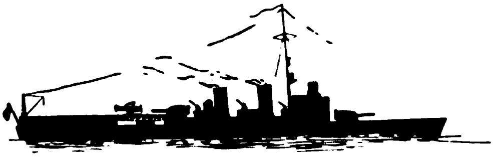


GERMANY. Armoured Ship. Deutschland.
Mainmast fitted on aft side of funnel. Catapult fitted abaft funnel.

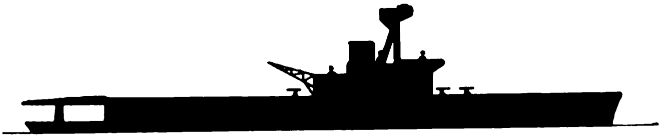
AIRCRAFT AND SEAPLANE CARRIERS AND TENDERS.



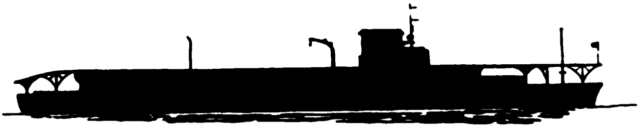
GREAT BRITAIN. Aircraft Carrier. Eagle.
Fore topmast added and mast structure modified.



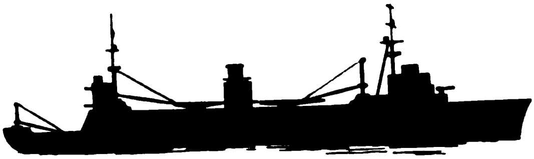
SWEDEN. Aircraft Cruiser. Gotland.



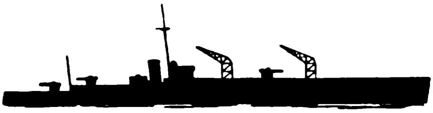
GREAT BRITAIN. Aircraft Carrier. Hermes.
Topmast and signal mast forward added. Flight deck extended aft.



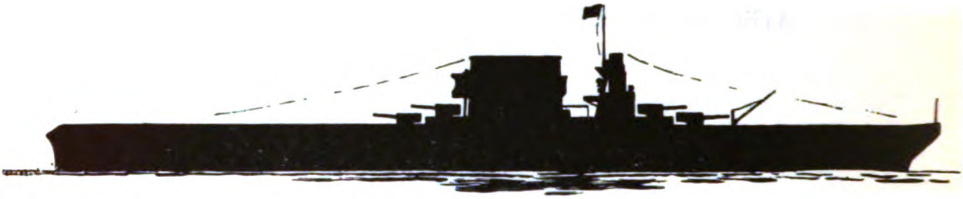
FRANCE. Aircraft Carrier. Béarn.



FRANCE. Aviation Transport. Commandant Teste.



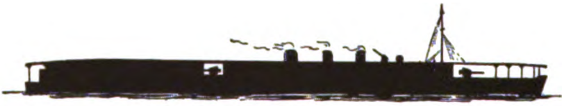
ROYAL AUSTRALIAN NAVY. Seaplane Carrier. Albatross.



UNITED STATES. Aircraft Carriers. Saratoga, Lexington.

GREAT BRITAIN. Aircraft Carriers. Courageous, Glorious.

NOTES.—The flight deck of Glorious has been lengthened aft, and now extends to the stern.
The quarter deck has also been raised a deck.
Tripod mast added before funnel.
Three wireless masts added each side of flight deck.
Flight deck extended aft.



JAPAN. Aircraft Carrier. Hosho.

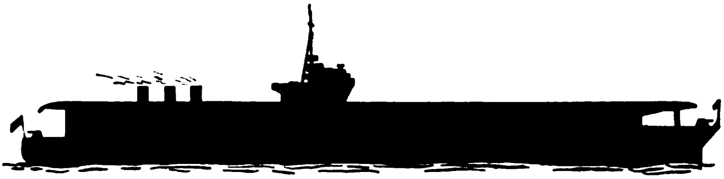
GREAT BRITAIN. Aircraft Carrier. Furious.

Three wireless masts added each side of flight deck.
Quarter deck has been raised one deck.

JAPAN. Aircraft Carrier. Akagi.

AIRCRAFT CARRIERS.

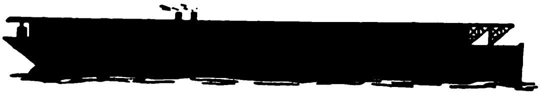
JAPAN. Aircraft Carrier. Kaga.



UNITED STATES. Aircraft Carrier Ranger.
(NOTE.—Funnels hinge outboard.)

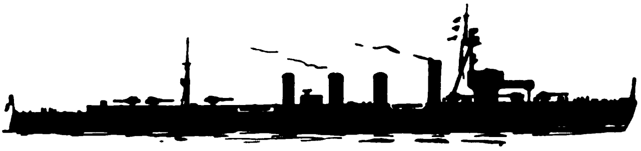
GREAT BRITAIN. Aircraft Carrier. Argus.
Flight deck. Levelled forward.

JAPAN. Aircraft Carrier. Ryujo.

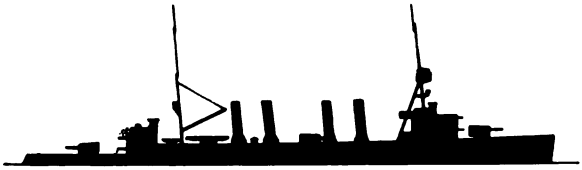


UNITED STATES. Aircraft Carrier. Langley.

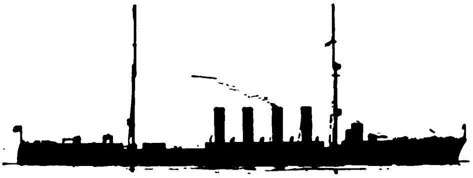
CRUISERS AND COAST DEFENCE SHIPS.



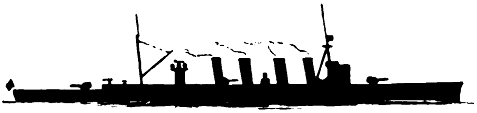
JAPAN. Cruisers. ("Sendai" class.) Naka, Sendai, Jintsu.
Catapult fitted abaft mainmast.



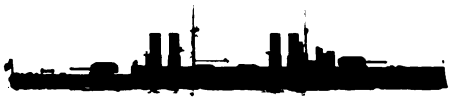
UNITED STATES. Scout Cruisers. ("Omaha" class.) Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.
(There are small differences in the arrangement of guns aft.)
Topmasts shortened.



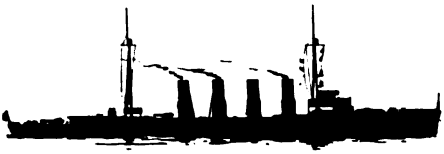
JAPAN. Cruisers. ("Chikuma" class.) Hirado, Yahagi.



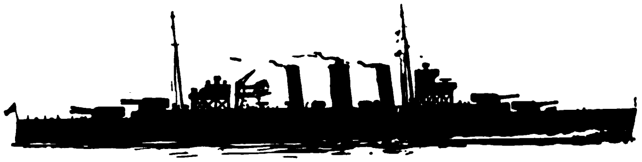
ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.



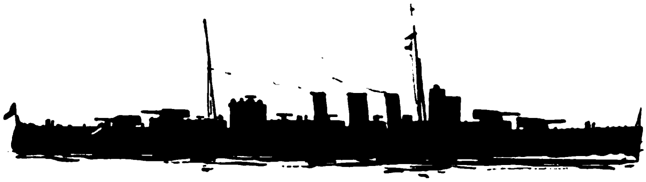
ITALY. Armoured Cruisers. (Classified as Battleships, 2nd class, in Italian official lists.) San Giorgio, San Marco.



ITALY. Light Cruiser. Taranto (*ex-German* Strassburg).

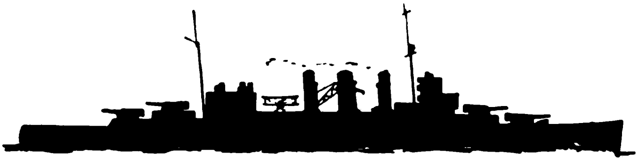


GREAT BRITAIN. Cruisers. (" London " class.) Devonshire, London, Shropshire, Sussex. (" Norfolk " class.) Dorsetshire, Norfolk.
Fore topgallant mast added.

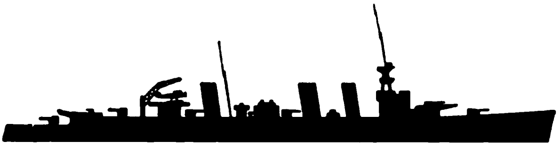


GREAT BRITAIN. Cruisers. ("Kent" class.) Berwick, Cornwall, Kent.
Cumberland and Suffolk have been modified as below. Kent has sternwalk.

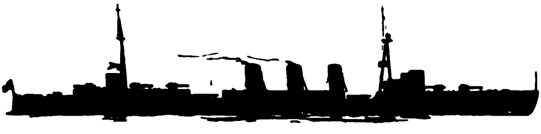
COMMONWEALTH OF AUSTRALIA. Cruisers. (" Kent" class.) Australia, Canberra.



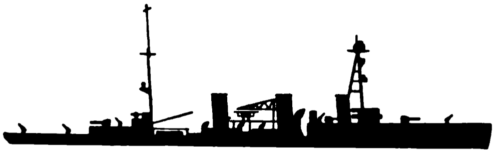
GREAT BRITAIN. Cruisers. (" Kent" class.) Cumberland and Suffolk (as reconstructed 1936).



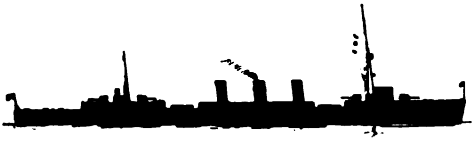
GREAT BRITAIN. Cruisers. (" E " class.) Emerald, Enterprise.
(In **Enterprise** the forward 6-in. guns are in a twin mounting on the forecastle deck.)



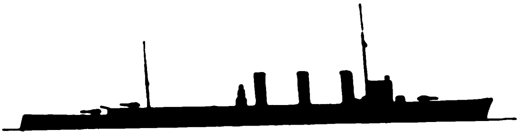
JAPAN. Light Cruisers. (" Kuma " class.) Kiso, Kitakami, Kuma, Oi, Tama. (" Natori " class.) Isudzu, *Natori, *Nagara, *Yura, *Kinu, *Abukuma.
* Has aircraft hangar incorporated in bridge structure.
Catapult fitted before mainmast.



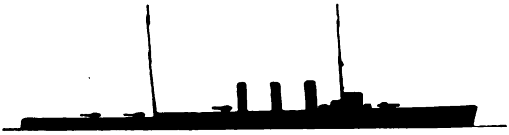
SOVIET UNION. Cruisers. Profintern, Chervonnaya, Ukraina.



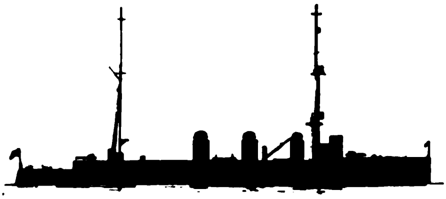
JAPAN. Light Cruisers. (" Tenryu " class.) Tatsuta, Tenryu.



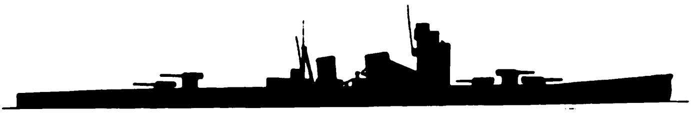
SPAIN. Light Cruiser. Mendez Nuñez.
Foremast is tripod. Fore topgallant mast added.



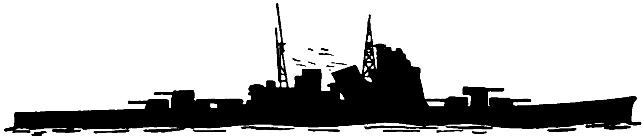
SPAIN. Light Cruiser. Republica.



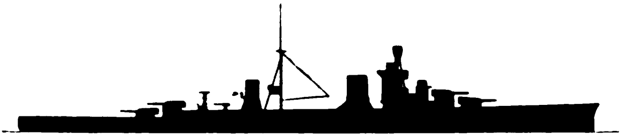
ITALY. Scout Cruiser. Quarto.



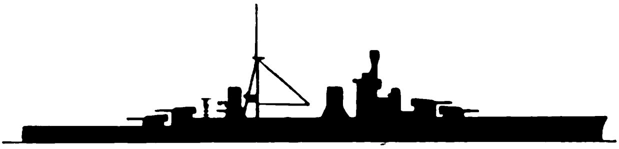
JAPAN. Cruisers. (" Nachi " class.) Nachi, Myoko, Ashigara, Haguro.
Catapult fitted abaft mainmast.



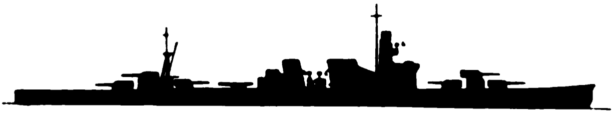
JAPAN. Cruisers. ("Takao" class.) Takao, Atago, Chokai, Maya.



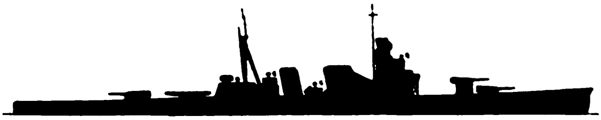
ITALY. Cruiser. (Modified " Trento " class.) Bolzano.
Forward superstructure modified. Catapult fitted amidships.



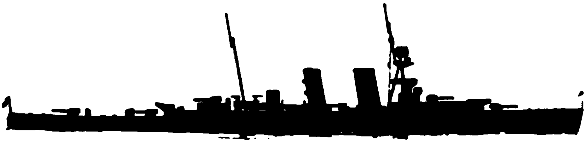
ITALY. Cruisers. ("Zara" class.) Pola, Zara, Fiume, Gorizia.
Forward superstructure modified. Catapult fitted forward.



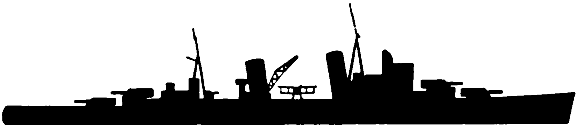
JAPAN. Cruisers. ("Furutaka" class.) Furutaka, Kato.
(The tops of the funnels are square to the funnels.)



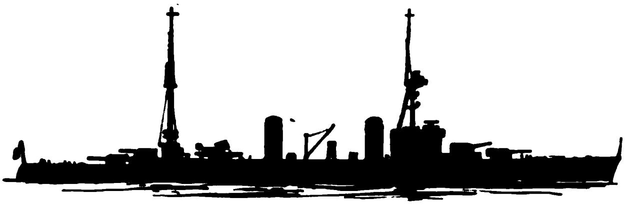
JAPAN. Cruisers. ("Furutaka" class.) Aoba, Kinugasa.
(The tops of the funnels are square to the funnels.)



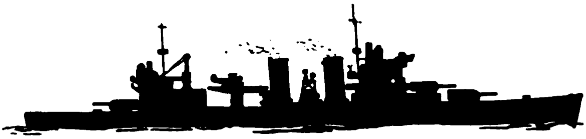
GREAT BRITAIN. Cruisers. (Improved "Birmingham" class.) Effingham, Frobisher, Hawkins, Vindictive.
(In **Vindictive** the raised 7·5-in. gun forward is removed and a hangar fitted forward of the bridge. Seaplane crane fitted aft of mainmast.)
NOTE.—These ships are being rearmed, the 7·5-inch guns and the after funnel being removed, catapult fitted between funnel and main mast.



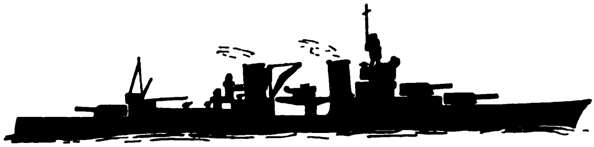
GREAT BRITAIN. Cruisers. ("Southampton" Class). Southampton, Newcastle, Sheffield, Birmingham, Glasgow, Gloucester, Liverpool, Manchester.



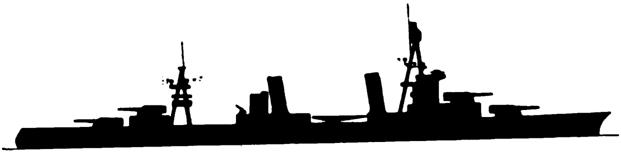
FRANCE. Cruisers. ("Duquesne" class.) Duquesne, Tourville. ("Suffren" class.) Suffren, Colbert, Foch, Dupleix.
(**Colbert, Dupleix** and **Foch** have tripod mainmasts and the catapults between the funnels.)
Fore topmast shortened in Foch, Duquesne and Tourville and removed in Dupleix.



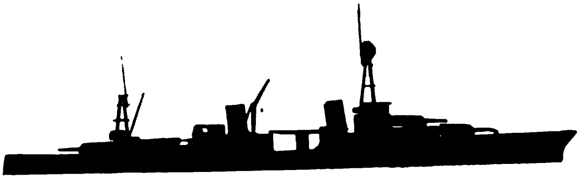
UNITED STATES. Cruisers. ("Astoria" class.) Astoria, New Orleans, Minneapolis, San Francisco, Tuscaloosa.



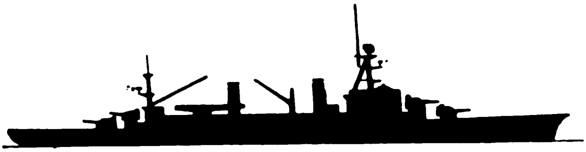
UNITED STATES. Cruisers. Portland and Indianapolis.
Fore topmast is raised.



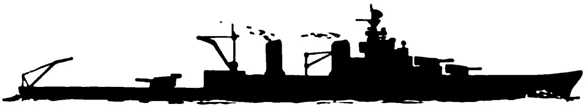
UNITED STATES. Cruisers. ("Pensacola" class.) Salt Lake City, Pensacola.
Crane fitted on fore side of after funnel.



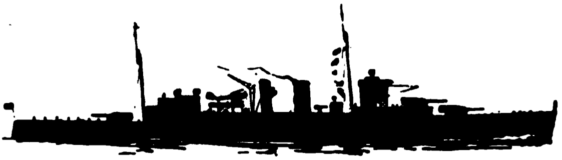
UNITED STATES. Cruisers. ("Chester" class.) Northampton, Chester, Louisville. ("Augusta" class.) Chicago, Houston, Augusta.



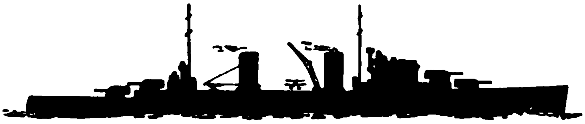
FRANCE. Training Cruiser. Jeanne d'Arc.
(The catapults are removed).



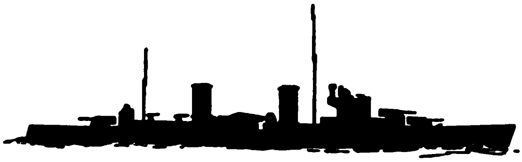
FRANCE. Cruisers. Jean-de Vienne, La Galissonnière, Marseillaise, Gloire, Montcalm, Georges Leygues.



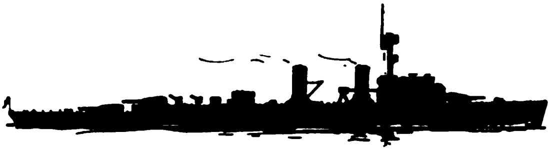
GREAT BRITAIN. Cruisers. York and Exeter. ("York" class.)
(In Exeter the funnels and masts are vertical.)
Forward funnel has been modified.



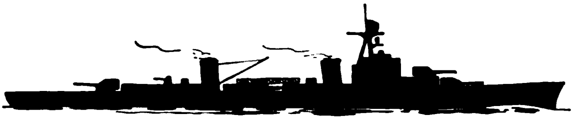
GREAT BRITAIN. Cruisers. ("Amphion" class.) Amphion, Apollo.
COMMONWEALTH OF AUSTRALIA. ("Amphion" Class.) Sydney.



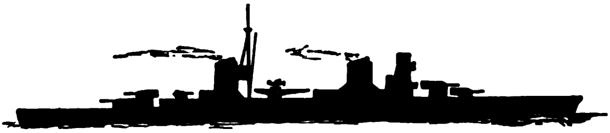
GREAT BRITAIN. Cruisers. ("Arethusa" class.) Arethusa, Galatea, Penelope, Aurora.



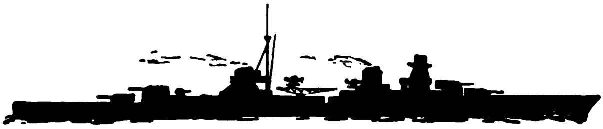
GERMANY. Light Cruisers. Köln, Karlsruhe, Konigsberg.
Mainmast fitted on aft side of after funnel. Catapult fitted between funnels.



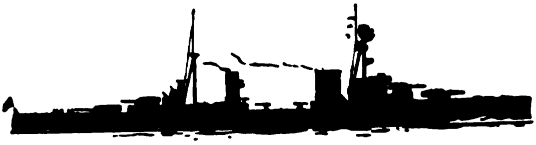
FRANCE. Cruiser Minelayer. Emilé Bertin.



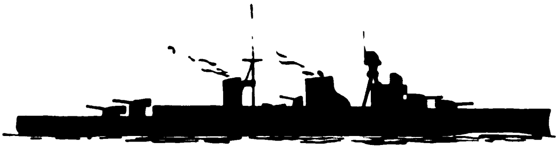
ITALY. Cruisers. ("Condottieri" class.) Montecuccoli, Muzio Attendolo.



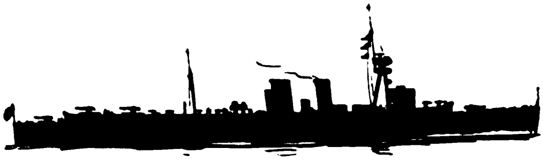
ITALY. Cruisers. ("Attendolo" class.) Eugenio di Savoia, Filiberto Duca d'Aosta.



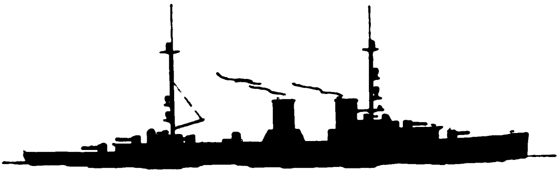
ITALY. Cruisers. ("Condottieri" class.) Alberico da Barbiano, Alberto di Giussano, Bartolomeo Colleoni, Giovanni delle Bande Nere.



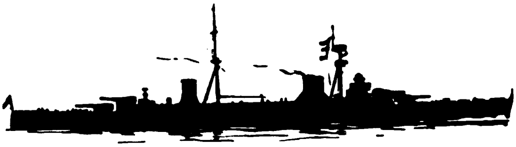
ITALY. Cruisers. "Condottieri" class.) Armando Diaz, Luigi Cadorna.
Stays to mainmast removed.



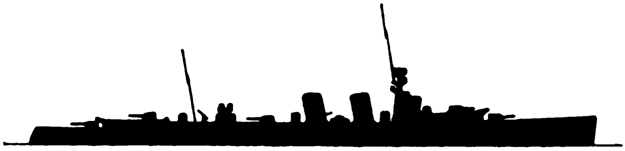
GREAT BRITAIN. Cruiser Minelayer. Adventure. (Stern has been extended.)
Derricks added abreast masts.



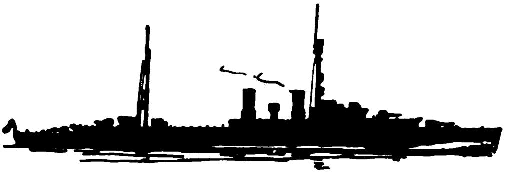
NETHERLANDS. Cruisers. Java, Sumatra.
Fore topmast shortened and foremast made larger.



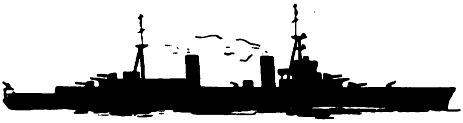
ITALY. Cruisers. ("Trento" class.) Trento, Trieste.
Fore topmast removed.



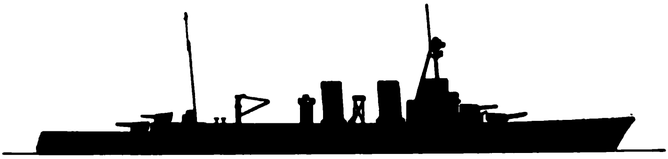
SPAIN. Cruisers. Libertad, Almirante Cervera, Miguel de Cervantes.
(The mainmasts are tripods.)



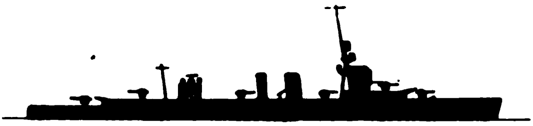
GERMANY. Light Cruiser. Emden.



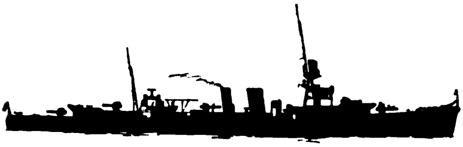
FRANCE. Cruiser Minelayer. Pluton.
Fore topmast shortened.



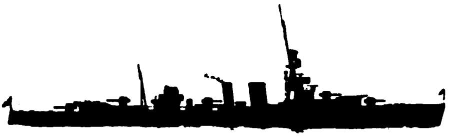
FRANCE. Cruisers. ("Duguay-Trouin" class.) La Motte Picquet, Duguay-Trouin, Primauguet.
Catapult fitted on quarter deck.



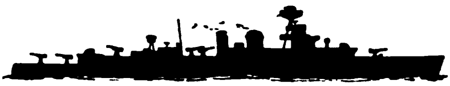
GREAT BRITAIN. Cruisers. ("D" class.) Danae, Dauntless, Dragon.



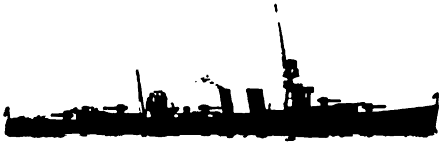
GREAT BRITAIN. Cruisers. ("D" class: repeat vessels.) Delhi, Dunedin, Diomede, Despatch, Durban.
Trawler bow fitted to Delhi.



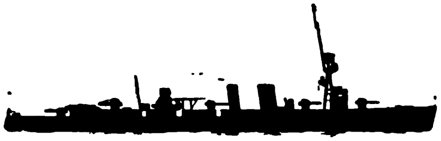
GREAT BRITAIN. Cruisers. ("Ceres" class.) Cardiff, Ceres, Curacoa.
For Coventry and Curlew, see below.



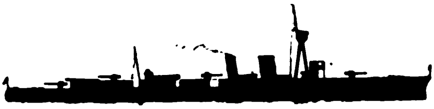
GREAT BRITAIN. Cruisers. ("Ceres" class.) Coventry and Curlew (as rearmed 1935).



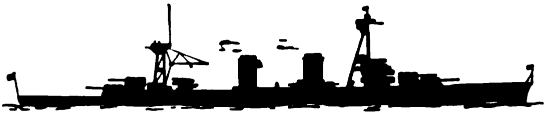
GREAT BRITAIN. Cruisers. ("Carlisle" class.) Cairo, Calcutta, Capetown, Carlisle, Colombo.



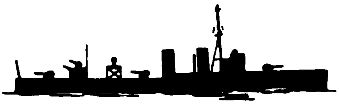
GREAT BRITAIN. Cruisers. ("Caledon" class.) Caledon, Calypso, Caradoc.



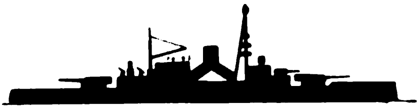
GREAT BRITAIN. Cruisers ("Cambrian" class.) Castor, Constance.



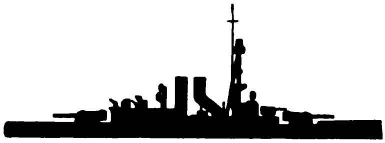
SOVIET UNION. Cruiser. Krasni Kavkaz.



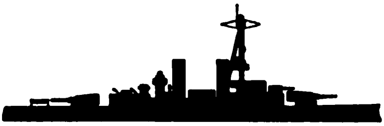
GREECE. Cruiser. Helle.



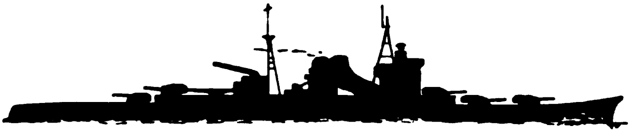
SWEDEN. Coast Defence Ships. Gustav V.
Fore topmast added.



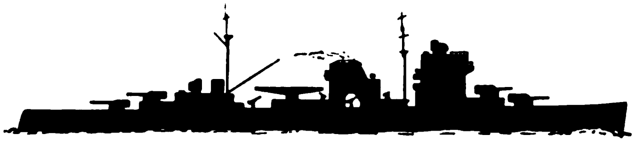
SWEDEN. Coast Defence Ship. Sverige.



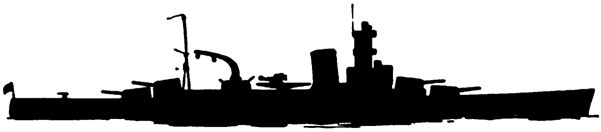
SWEDEN. Coast Defence Ship. Drottning Victoria.



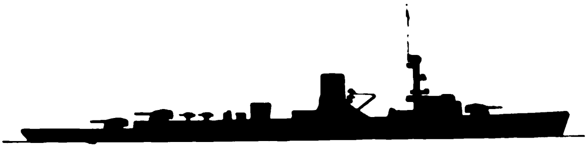
JAPAN. Cruisers. Mikuma, Mogami, Suzuya, Kumano, Tone, Tikuma.



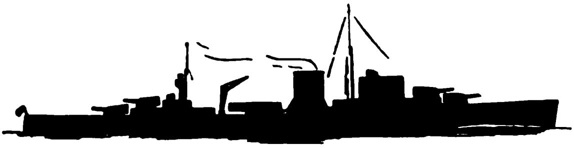
SPAIN. Cruisers. Baleares, Canarias.
Main topmast and topgallant mast removed.



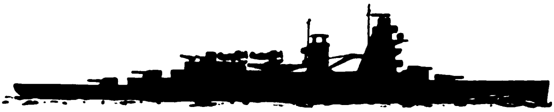
FRANCE. Cruiser. Algérie.
Superstructure amidships modified and two derricks fitted.



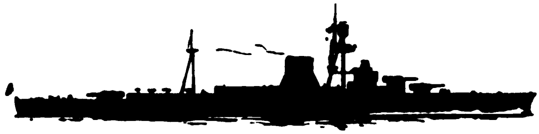
GERMANY. Light Cruiser. Leipzig.
Mainmast fitted on aft side of funnel. Catapult fitted between funnel and foremast.



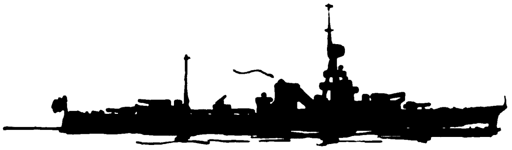
GREAT BRITAIN. Cruisers. (" Leander " class.) Leander, Achilles, Neptune, Orion.



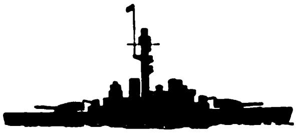
NETHERLANDS. Cruiser. De Ruyter.



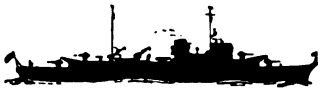
ARGENTINE. Cruisers. Almirante Brown, Vinticinco de Maio.
Fore topmast shortened, main topmast lengthened.



JAPAN. Light Cruiser. Yubari.
Masts raked aft.



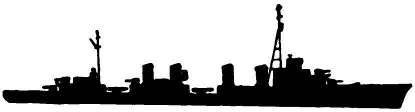
FINLAND. Armoured Gunboats. Vaïnämöinen, Ilmarinen.



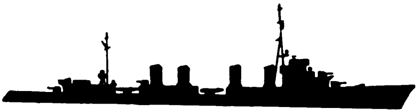
NORWAY. Minelaying and Training Ship. Clav Trygvason.

FLOTILLA LEADERS AND DESTROYERS

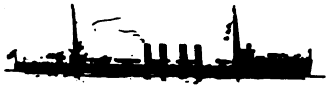
(See pp. 267–295.)



FRANCE. **Flotilla Leaders.** **Cassard, Vauquelin, Kersaint, Tartu, Maillé Brézé, Le Chevalier Paul.**

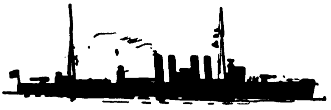


FRANCE. **Flotilla Leaders.** **Bison, Guépard, Lion, Vauban, Valmy, Verdun.**

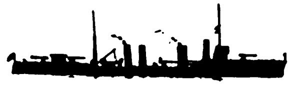


UNITED STATES. **Destroyers.** **Aylwin, Balch, Benham, Duncan, Parker, Cassin, Cummings and Downes.**

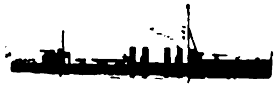
Sampson, Rowan, Davis, Allen, Wilkes, Shaw, Tucker, Conyngham, Porter, Wadsworth, Wainwright, O'Brian, Nicholson, Winslow, McDougal, Cushing and Ericsson, are generally similar.



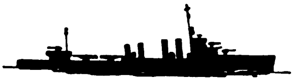
UNITED STATES. **Destroyers.** **The "Flush Deck" type; all U.S. destroyers except those in the preceding silhouette and those with three funnels.**



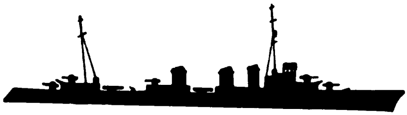
FRANCE. **Destroyers.** **Téméraire, Opiniâtre.**



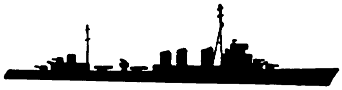
FRANCE. **Destroyers.** **Enseigne Roux, Mécanicien Principal Lestin.**



FRANCE. **Destroyer.** **Enseigne Gabolde.**

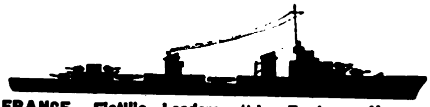


FRANCE. **Flotilla Leaders.** **Tigre, Chacal, Jaguar, Léopard, Panthère, Lynx.**

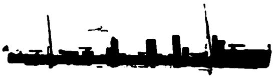


FRANCE. **Destroyers.** **Mistral, Cyclone, Bourrasque, Orage, Ouragon, Simoun, Siroco, Tempête, Tramontane, Typhon, Trombe, Tornado.**

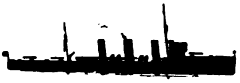
POLAND. **Destroyers.** **Burza, Wicher,** are similar.



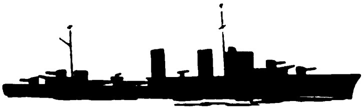
FRANCE. **Flotilla Leaders.** **"Le Fantasque"** class (6 ships).



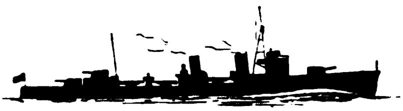
FRANCE. **Destroyers.** **Algérien, Annamite, Arabe, Bambara, Hova, Kabyle, Marocain, Sakalave, Sénégalais, Somali, Tonkinois, Touareg.**



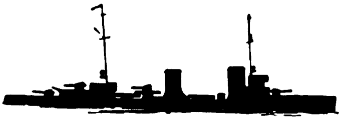
ITALY. **Destroyers.** **Gen. A. Cantore, Gen. A. Chinotto, Gen. A. Papa, Gen. A. Cascino, Gen. M. Prestinari, Gen. C. Montanari, A. Bassini, E. Cosenz, F. Stocco, G. Carini, G. Medici, G. Acerbi, G. la Farina, G. la Masa, G. Sirtoti, N. Fabrizi, V. Orsini.**



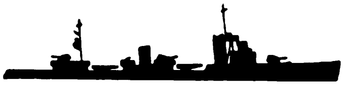
YUGO SLAVIA. **Flotilla Leader.** **Dubrovnik.**



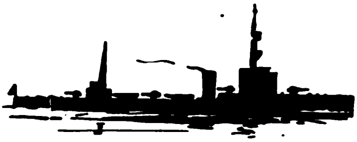
JAPAN. **1st Class Destroyers.** **"Fubuki" class.** (24 ships.)



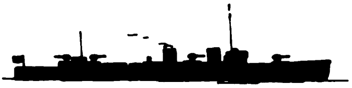
FRANCE. **Flotilla Leader.** **Amiral Sénès.**



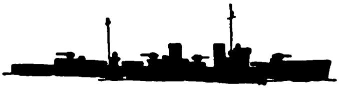
ITALY. Flotilla Leaders (Scouts). "Navigatori" class. A. da Mosto, etc. (12 ships.)



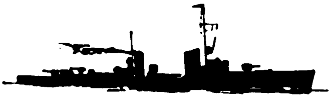
ITALY. Flotilla Leaders (Scouts). Leone, Pantera, Tigre.



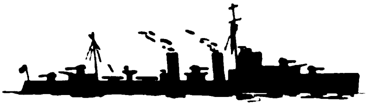
JAPAN. 1st Class Destroyers. "Mutsuki" class (12 ships), and "Kamikase" class (9 ships).



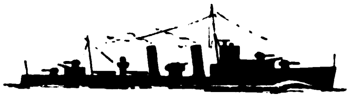
JAPAN. 1st class Destroyers. "Minekase" class (15 ships).



GERMANY. Destroyers. Iltis, Wolf, Tiger, Luchs, Jaguar, Leopard, Seeadler, Greif, Albatros, Kondor, Falke, Möwe.

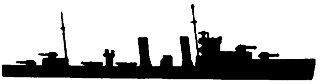


GREAT BRITAIN. Flotilla Leader. Codrington.

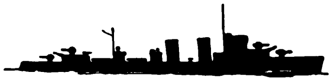


GREAT BRITAIN. Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes.

Flotilla Leaders. Keith, Duncan and Kempenfelt.

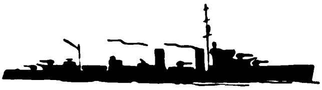


GREAT BRITAIN. Destroyers. "Greyhound," "Hero" and "Intrepid" Classes.

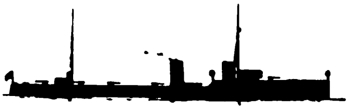


PORTUGAL. Destroyers. Vouga, Lima, Dao.

COLOMBIA. Destroyers. Antioquia, Caldas.



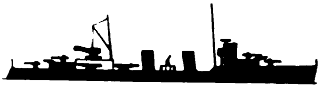
ARGENTINE. Flotilla Leaders. Mendoza, La Rioja, Tucuman.



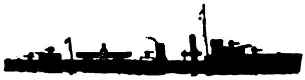
ITALY. Flotilla Leaders (Scouts). Carlo Mirabello, Augusto Riboty.

GREAT BRITAIN. Flotilla Leaders. Broke, Keppel, Shakespeare, Spenser, Wallace, Bruce, Douglas, Campbell, Mackay, Malcolm, Montrose, Stuart. [In Stuart the torpedo tubes are removed.]

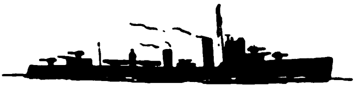
SPAIN. Flotilla Leaders. Almirante Valdes, etc., generally similar.



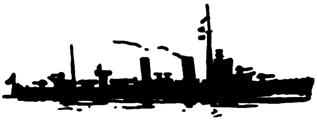
HOLLAND. Destroyers. De Ruyter, Evertsen, Piet Hein, Kortenaer, Banckert, Van Nes, Van Galen, Witte de With.



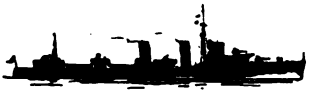
GREAT BRITAIN. Destroyers. Vanessa, Vanity, Vanoc, Vanquisher, Vectis, Vega, Velox, Vendetta, Venetia, Venturous, Verdun, Versatile, Vesper, Vidette, Vimiera, Violent, Vivacious, Vivien, Vimy (*late* Vancouver), Vortigern, Valhalla, Valentine, Valkyrie, Valorous, Vampire, Viceroy, Viscount, Voyager, Wakeful, Walker, Walpole, Walrus, Warwick, Watchman, Waterhen, Wessex, Westcott, Westminster, Whirlwind, Whitley, Winchelsea, Winchester, Wolfhound, Wolsey, Woolston, Wrestler, Wryneck.



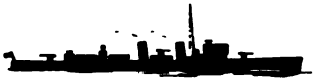
GREAT BRITAIN. Destroyers. Whitehall, Whitshed, Wildswan, Witherington, Wivern, Wolverine, Worcester, Wishart, Witch.



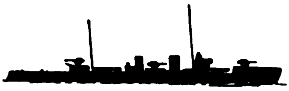
GREAT BRITAIN. Destroyers. Ambuscade, Amazon.



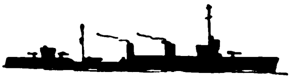
CHILE. Destroyers. Serrano, Orella, Riquelme, Hyatt, Videla, Aldea.



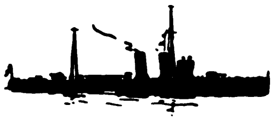
SWEDEN. Destroyers. Klas Horn, Klas Uggla, Ehrensköld, Nordenskjold.



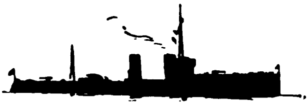
JAPAN. 2nd class Destroyers. "Wakatake" class (7 ships), and "Kaya" class (19 ships).



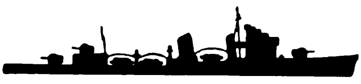
FRANCE. Destroyers. Aventurier, Intrépide.



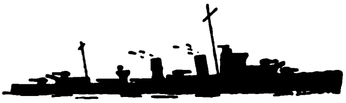
ITALY. Destroyers. Q. Sella, B. Ricasoli, F. Crispi, G. Nicotera.



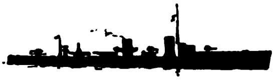
ITALY. Destroyers. Alessandro Poerio and Guglielmo Pepe.



JAPAN. Destroyers. "Hibiki" class.

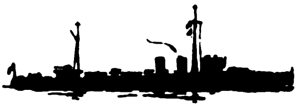


GREAT BRITAIN. Flotilla Leaders. Exmouth, Faulkner.

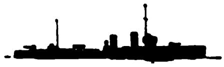


GREAT BRITAIN. Destroyers. Admiralty "S" class.

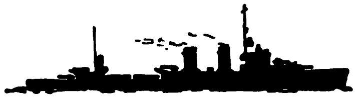
ITALY. Destroyers. Palestro, San Solferino, Martino, Confienza.



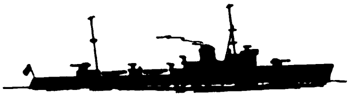
ITALY. Destroyers, Turbine. Nembo, Euro, Borea, Espero, Ostro, Zeffiro, Aquilone, N. Sauro, F. Nullo, D. Manin, C. Battisti.



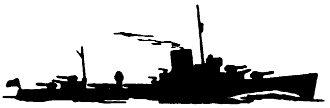
DENMARK. Torpedo Boats (1st Class). Glentin, Hogen, Ornen, Laxen, Dragen, Hvalen.



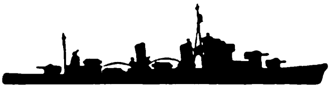
UNITED STATES. Destroyers. "Farragut" class.



ITALY. Destroyers. Dardo, Freccia, Strale, Saetta, Folgore, Lampo, Baleno, Fulmine.



GREECE. Destroyers. Hydra, Spetzai, Psara and Coundouriotis.



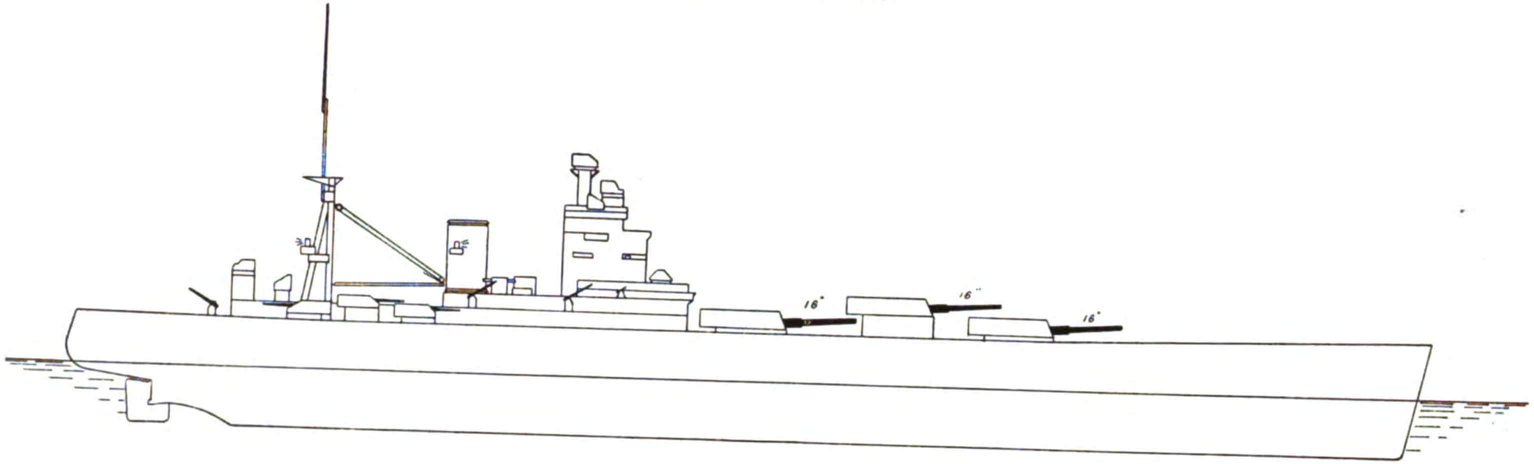
JAPAN. Destroyers. "Ariake" class (17 ships).

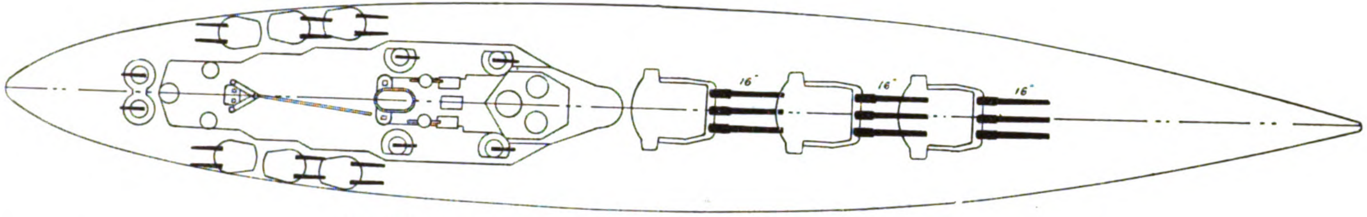
PLANS OF
BRITISH AND FOREIGN WARSHIPS

GREAT BRITAIN.

BATTLESHIPS.

Nelson. **Rodney.**





Length (extreme), 710 ft.; Rodney, 33,900 tons; Nelson, 33,500 tons; Speed, 23 knots; Completed, 1927.
Armament, 9—16-in.; 12—6-in.; 6—4·7-in. A A.; 4—3-pr.; 2—2-pr Pom Poms; 11 L.; 5 M.; 2 24-in. submerged torpedo tubes.

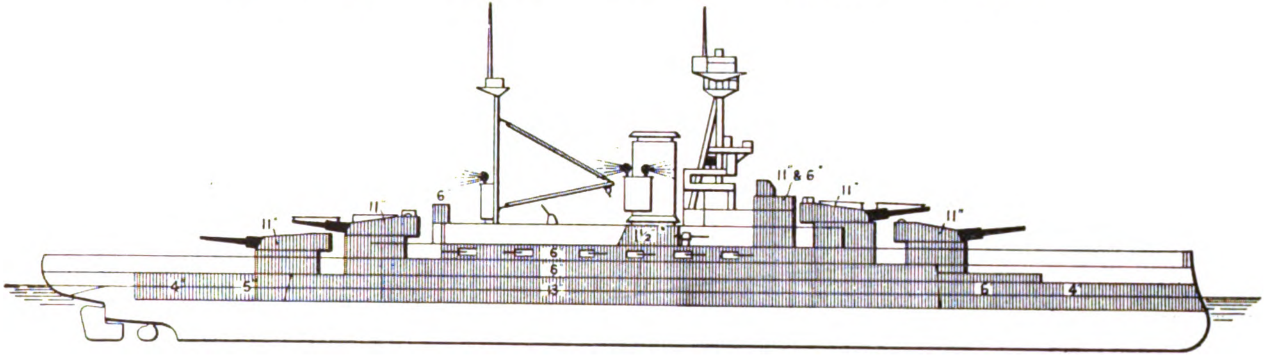
NOTE.—A 14-in. waterline armour belt extends from approximately the foremost 16-in. turret to approximately the aftermost 6-in. turret. The turret armour varies from 16-in. to 9-in.

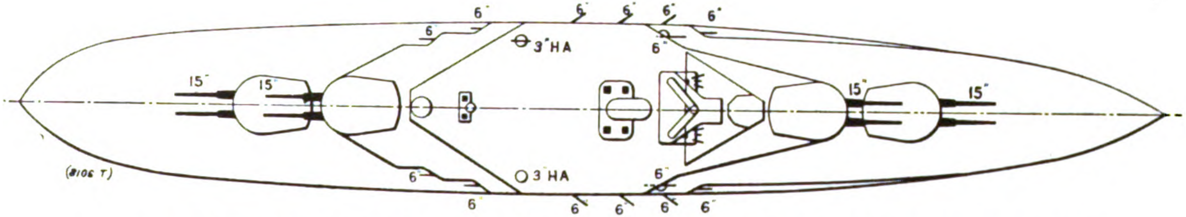
Correction to plan.—Platform built on fore side of funnel.

GREAT BRITAIN.

BATTLESHIPS.

Royal Sovereign. Royal Oak. Revenge. Resolution. Ramillies.





Length (extreme), 620 ft. 6 ins.* ; Length B.P., 580 ft. ; 29,150 tons ; Speed, 23 knots (without bulges) ; Completed, 1916–17. Armament, 8—15 in. ; 12—6 in. ; 4—4-in. A.A. ; 4—3-pr. ; 5 M ; 10 L. ; 2—21-in. submerged torpedo tubes.

Corrections to plan.—Searchlights on mainmast and the superstructure 6-in. guns now removed. Four 4-in. A.A. guns are fitted on the superstructure instead of the 3-in. H.A. shown.

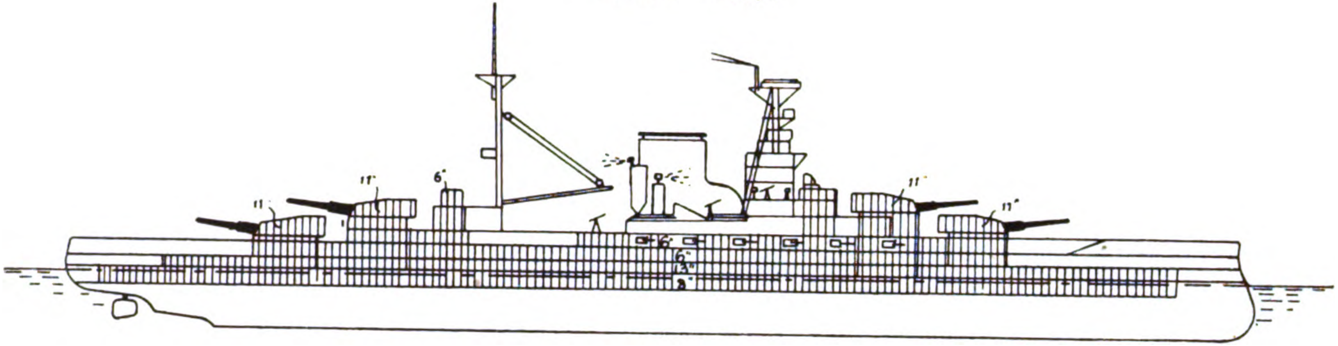
* Revenge, 625 ft. 9 in.

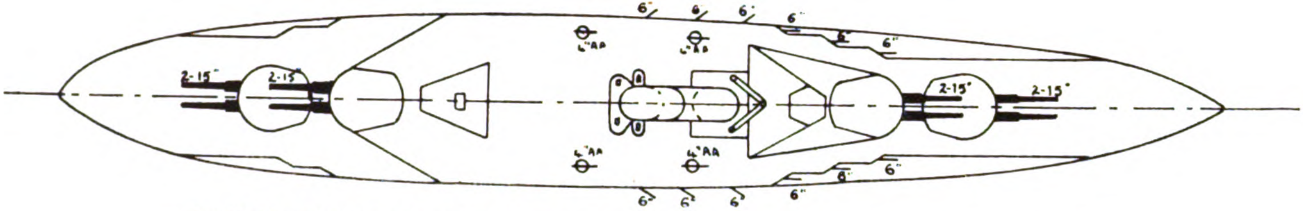
Resolution, Royal Oak and Ramillies have a catapult on "X" Turret and a crane abreast the mainmast, and carry 1 aircraft each.

GREAT BRITAIN

BATTLESHIPS.

Barham. Malaya.





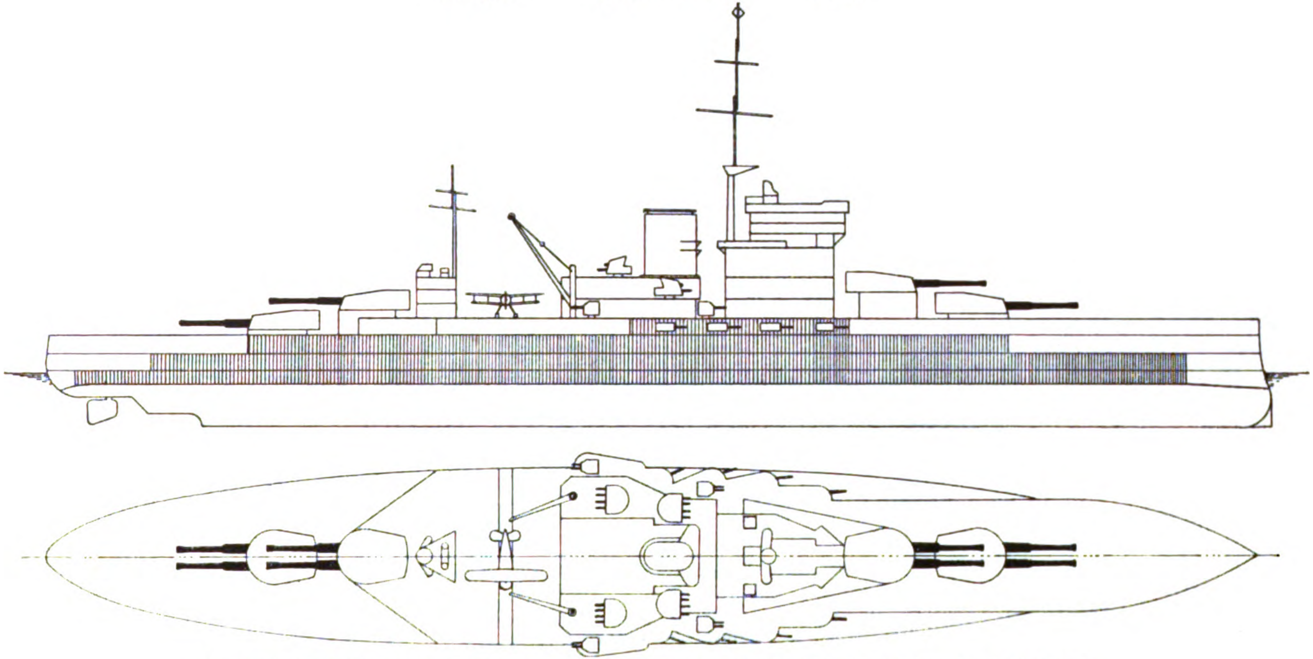
Length B.P., 600 ft.; (extreme 639¾—644½ ft.); 31,100 tons; Speed, 25 knots (without bulges); Completed, 1915-1916.
Armament, 8—15-in.; 12—6-in.; 4—4-in. A.A.; 4—3-pr.; 5 M.; 10 L.; 2—21-in. submerged torpedo tubes.

NOTES.—Barham has tripod mainmast, main topgallant mast, catapult on " X " turret and a crane abreast mainmast.
Malaya has main topgallant mast, catapult before mainmast, a hangar and crane each side abreast funnel. Derrick removed.

GREAT BRITAIN.

BATTLESHIPS.

Warspite. Queen Elizabeth. Valiant.

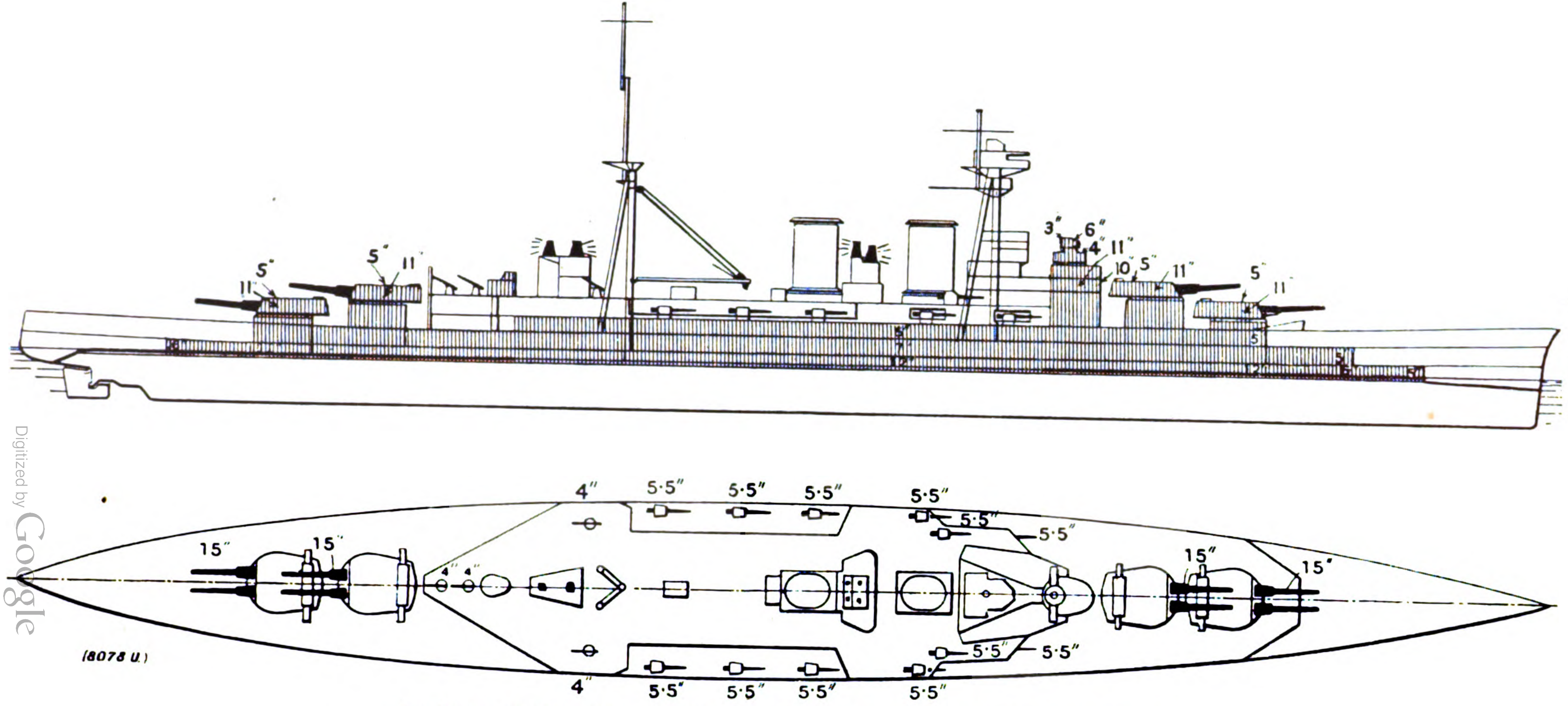


Length B.P., 600 ft.; (extreme 639 ft. 8 ins.—646 ft.); 31,100 tons; Speed 25 knots; Completed, 1915–1916.
Armament, 8—15-in.; 8—6-in.; 8—4-in. A.A.; 4—2-pdr. Pom Poms; 2—21-in. torpedo tubes; 1 catapult; 1 aircraft.
NOTES.—Queen Elizabeth and Valiant have tripod foremasts and are under reconstruction.

GREAT BRITAIN.

BATTLE-CRUISER.

Hood.



Length (extreme), 860 ft. 10 ins. ; Length B.P., 810 ft. ; 42,100 tons; Speed, 31* knots ; Completed, 1920.
Armament, 8—15-in. ; 12—5·5-in. ; 4—4-in A.A. ; 4—3-pdr. ; 5 M. ; 10 L. ; 2 –2-pdr. Pom Poms. ; 4 A.W. and 2 sub. 21-in. torpedo tubes.
* Trials at 44,600 tons, 31·89 knots with 151,000 S.H.P.
Correction to plan.—Fore topgallant mast added and bridgework modified.

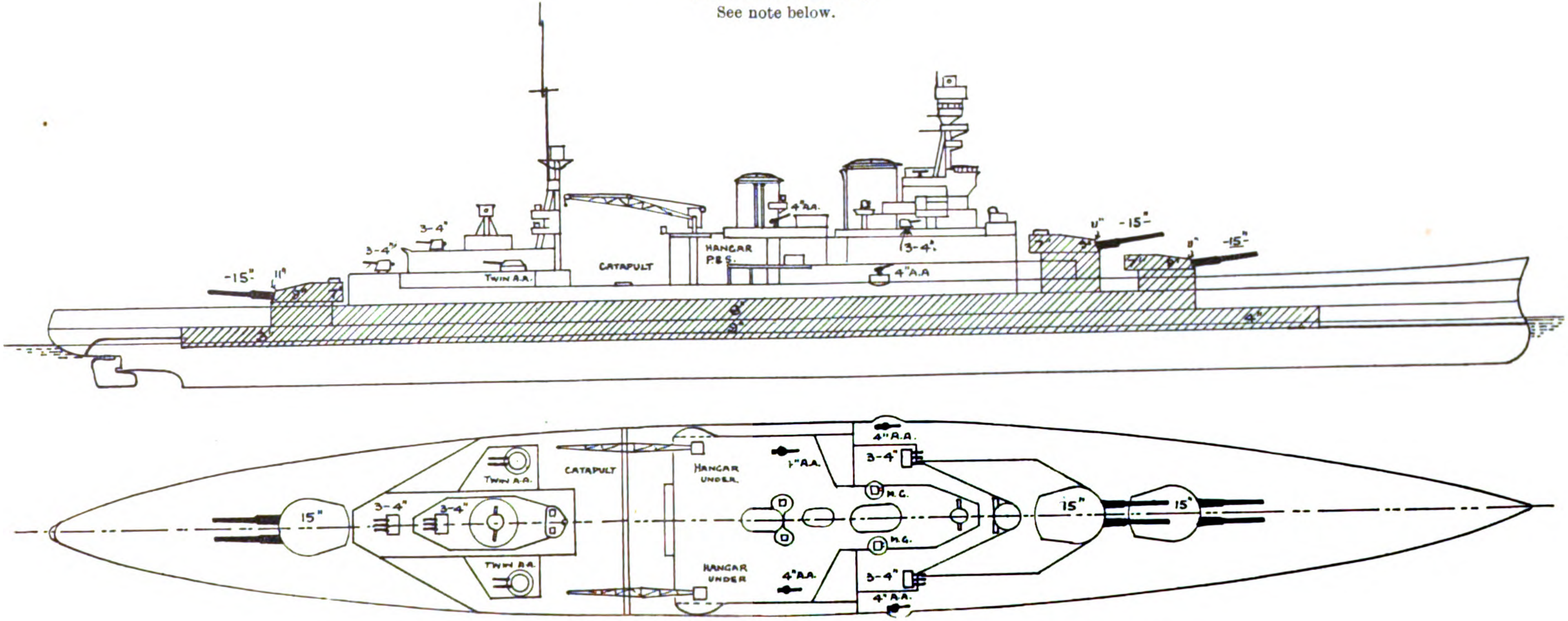
GREAT BRITAIN.

BATTLE-CRUISERS.

Repulse. **Renown.**

(After reconstruction.)

See note below.

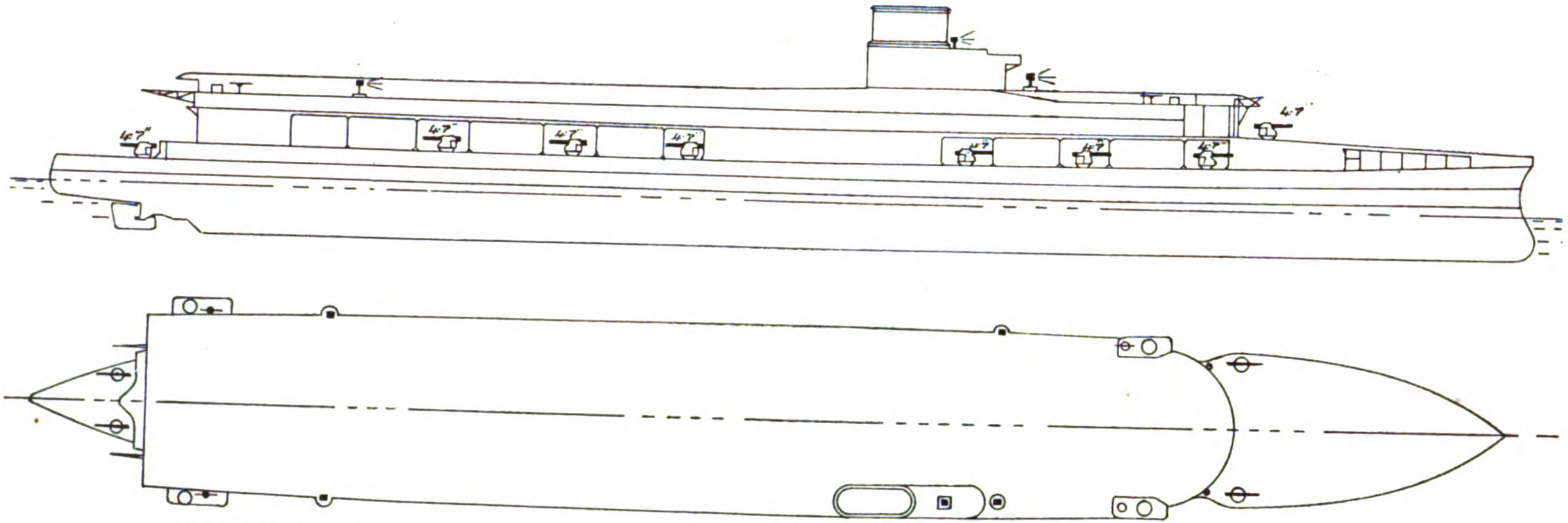


Length (extreme), 794 ft. 2 ins.; 32,000 tons; **Speed, 31½ knots (without bulges); Completed, 1916.**
Repulse was reconstructed 1936. **Renown is now in hand for similar modifications, and is in addition being equipped with new engines.**
Armament, 6—15-in.; 12—4-in.; 8—4-in. A.A.; **2 twin A.A.; 2 multi machine guns; 1 catapult; 4 aircraft**

GREAT BRITAIN.

AIRCRAFT CARRIERS.

Courageous. Glorious.



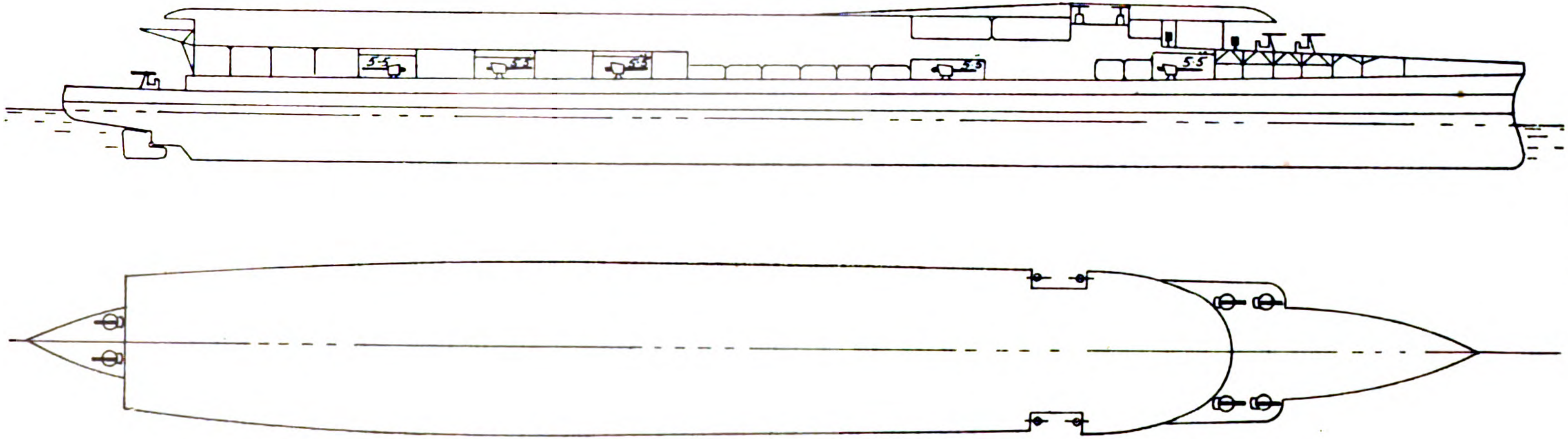
Length (extreme), 786 ft. 3 ins.; 22,500 tons; Speed, 30½ knots; Launched as cruisers (1916); converted to aircraft carriers (completed, 1928 and 1930 respectively). Armament, 16—4·7-in.; 4—3-pr.; 3—2-pr. Pom Poms; 4 M.; 42 L.

Corrections to plan.—Flight deck of Glorious has been lengthened and extends aft to the stern. The quarter deck of Glorious has also been raised a deck. Tripod mast added before funnel. Three wireless masts added each side of flight deck. Flight deck extended aft.

GREAT BRITAIN

AIRCRAFT CARRIER.

Furious.

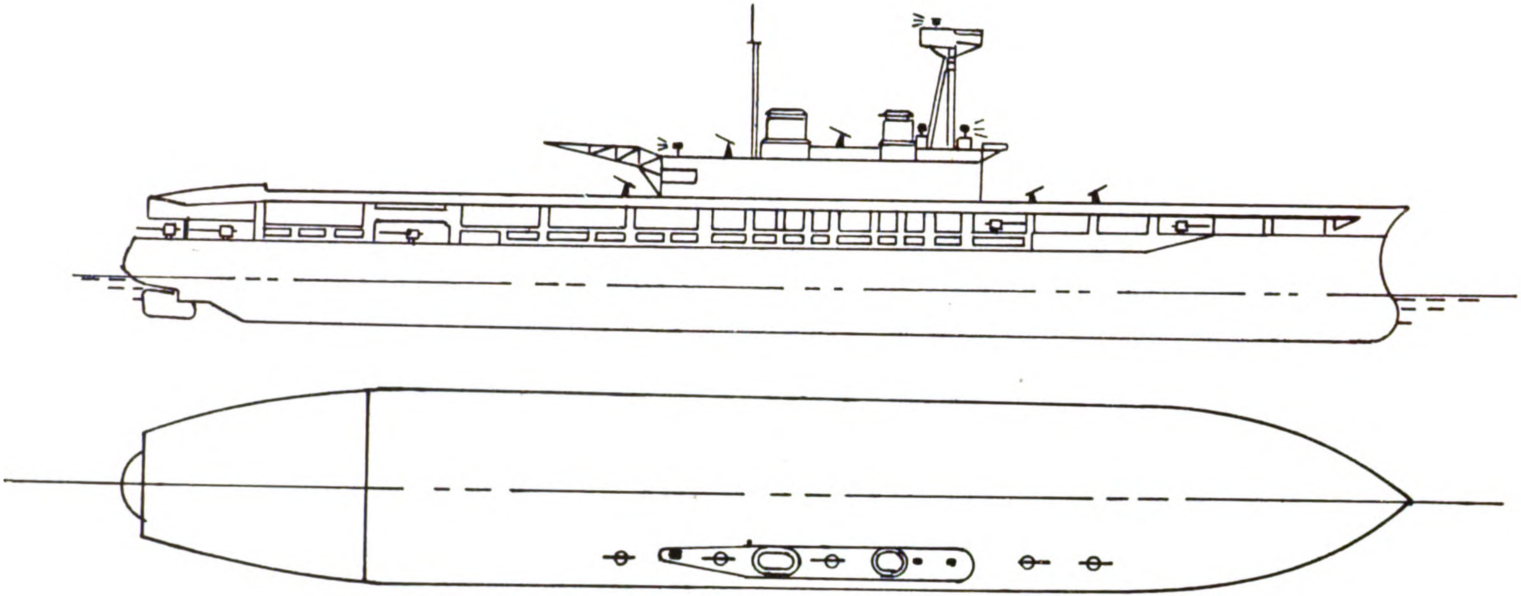


Length (extreme), 786 ft. 6 ins.; 22,450 tons; Speed, 31 knots; Completed as a cruiser, 1917; Conversion to aircraft carrier completed, 1925.
Armament, 10—5·5-in.; 3—4-in A.A.; 4—3-pr.; 4—2-pr.; 46 smaller.
Three wireless masts added each side of flight deck. Quarter deck has been raised one deck.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Eagle.

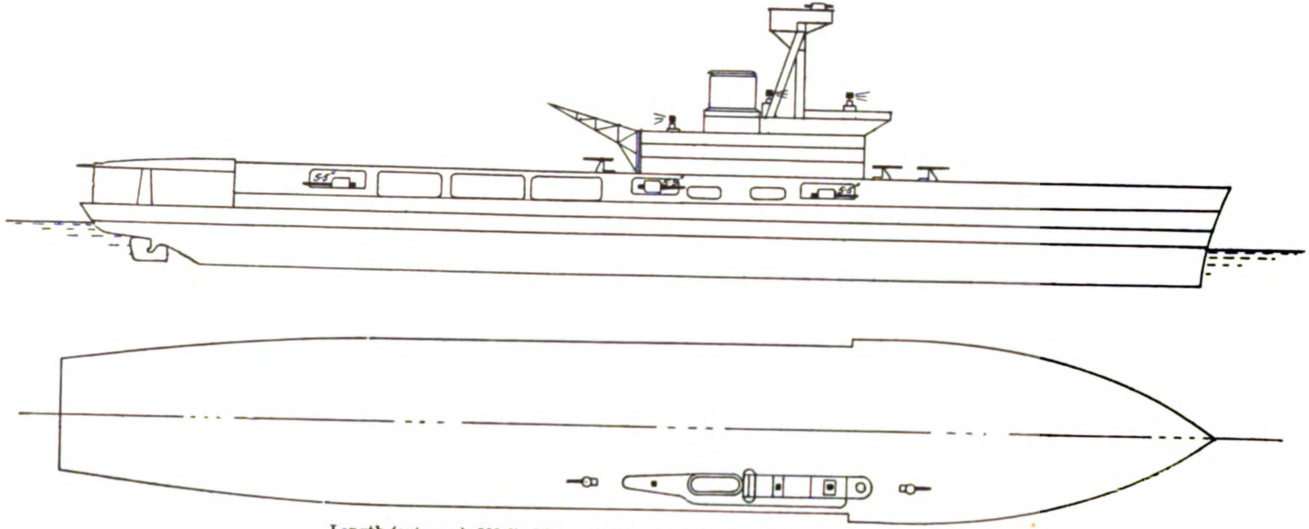


Length (extreme), 667 ft. 6 ins.; 22,600 tons; Speed, 24 knots; Completed as an aircraft carrier, 1924.
Armament, 9—6-in.; 4—4-in. A.A.; 4—3-pr.; 32 smaller.
Fore topmast added and mast structure modified.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Hermes.



Length (extreme), 599 ft. 6 ins.; 10,850 tons; Speed, 25 knots; Completed, 1924.
Armament, 6—5·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 M.; 16 L.
Flight deck extended aft. Fore topmast and signal mast forward added.

GREAT BRITAIN.

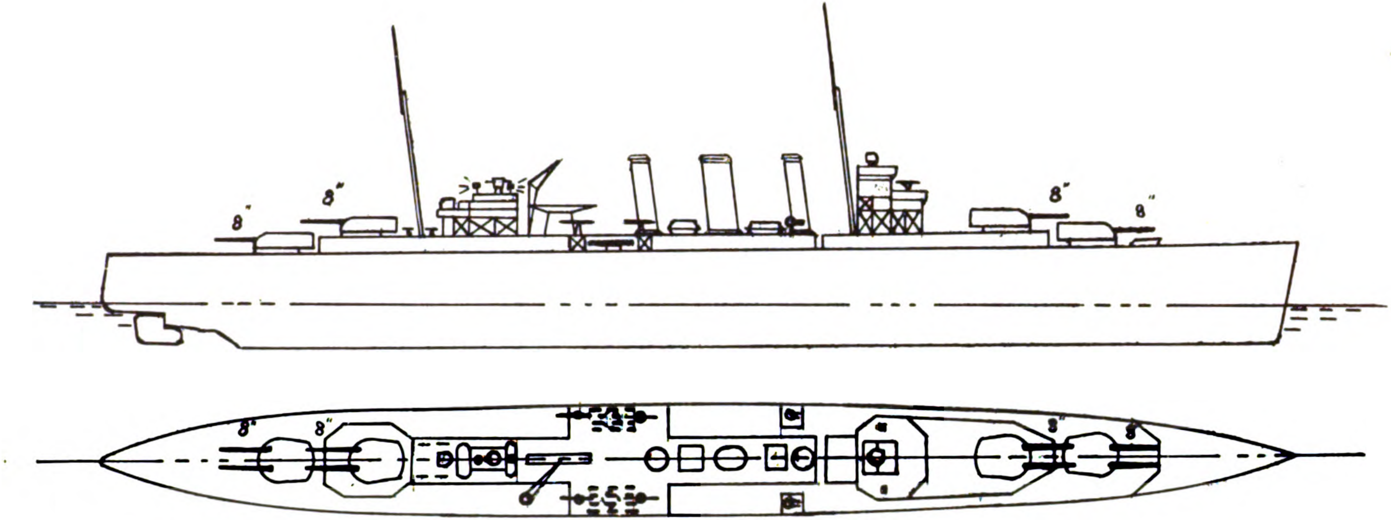
CRUISERS.

"London" Class.

London. **Sussex.** **Shropshire.** **Devonshire.**

"Norfolk" Class.

Dorsetshire.* **Norfolk.***



Displacements, 9,730—9,900 tons; Length (extreme), 630 ft.; Norfolk and Dorsetshire, 633 ft. Armament, 8—8-in.; 4—4-in. A.A.; 4—3-pr.; 4—2-pr. Pom Poms; 4 M.; 8 L.; 8—21-in. torpedo tubes; 1 aircraft; 1 catapult.

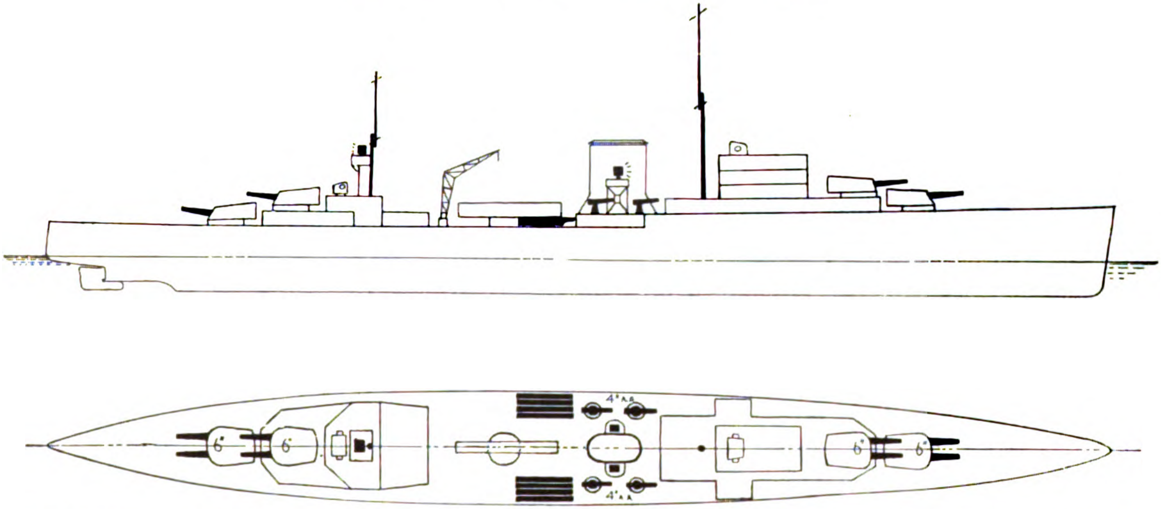
* In Dorsetshire and Norfolk the seaplane crane and the 4—4-in. guns are slightly forward of the positions shown. Fore topgallant mast added.

GREAT BRITAIN.

CRUISERS.

"*Leander*" *Class*

Leander. **Achilles.** **Neptune.** **Orion.**



Displacement, 7,000 tons; Length (extreme), 554 ft. 6 ins.; Speed 32½ knots. Armament, 8—6-in., 4—4-in. A.A., 4—3-pr., 8 torpedo tubes; 1 catapult; 1 aircraft.

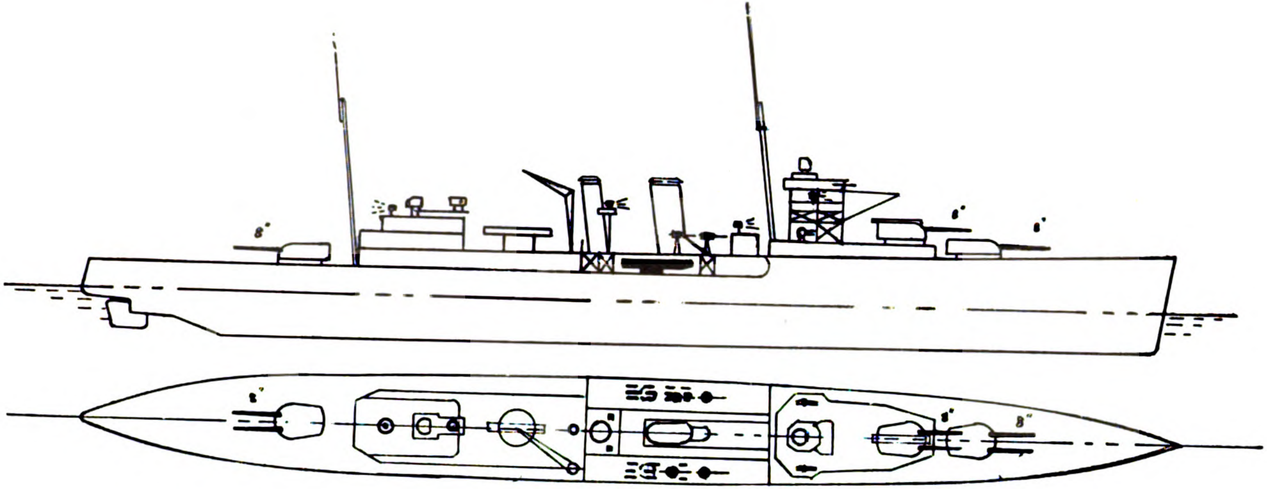
Leander and Achilles, completed 1933. Neptune and Orion, completed 1934.

GREAT BRITAIN

CRUISERS.

"York" Class.

York, **Exeter.***



Displacement: York, 8,250 tons: Exeter, 8,390 tons; Length (extreme), 575 ft.; Speed: York, 32¼ knots; Exeter. 32 knots. Armament, 6—8-in.; 4—4-in. A.A.; 4—3-pr.; 2—2-pr.; 4 M.; 8 L.; 6—21-in. torpedo tubes; 2 catapults; 2 aircraft.

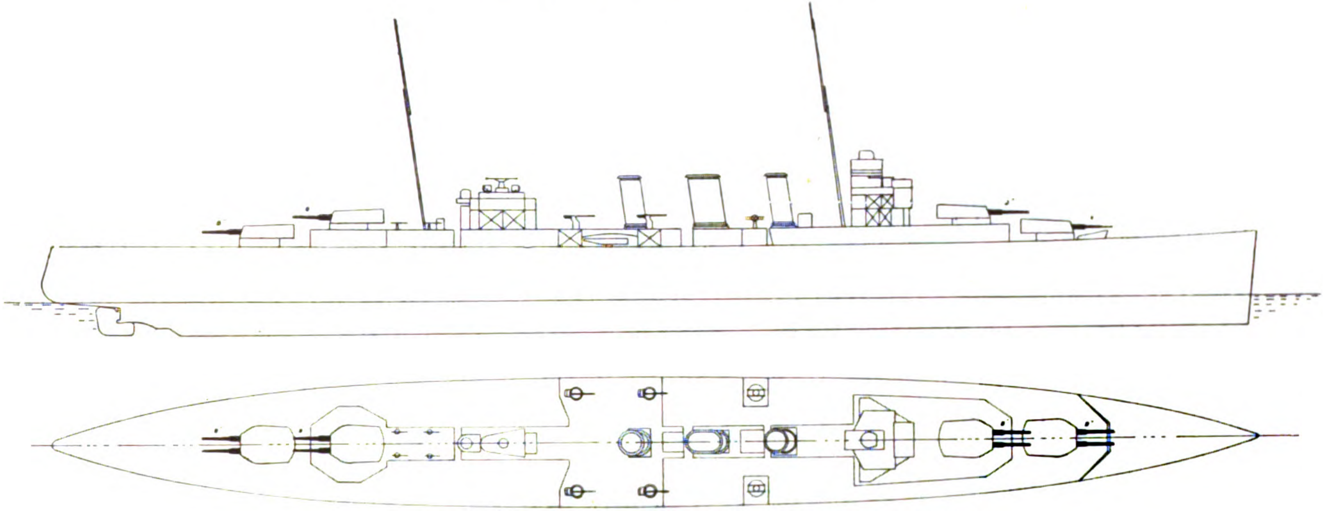
* In Exeter funnels and masts are vertical, and the mainmast is taken up through the superstructure.

GREAT BRITAIN.

CRUISERS.

"Kent" Class.

Kent. **Berwick.** **Australia.*** **Canberra.***



Length (extreme), 630 ft.; B.P., 590 ft.; 9,750 to 9,870 tons; Speed, 31½ knots,
Armament, 8—8-in.; 4—4-in. A.A.; 4—3-pr.; 4—2-pr. Pom Poms; 4 M.; 8 L.; 2 Q.R. 21-in. **torpedo tubes.**

* H.M. Australian Navy.

NOTE.—The vessels of this class are being modified.

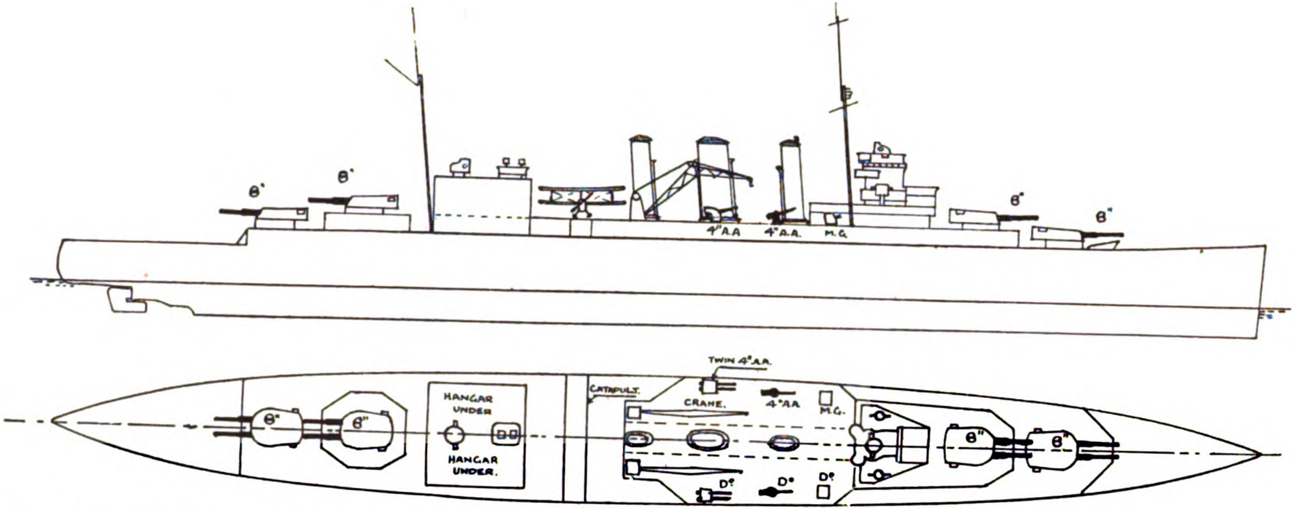
Cumberland and Suffolk were completed 1936. Cornwall completed 1937—see next page for plans **after alterations.**

GREAT BRITAIN.

CRUISERS.

Cumberland. **Suffolk.** **Cornwall.**

(As reconstructed 1936.)



Length (extreme), 630 ft. ; 10,000 tons ; Speed 31½ knots ; Completed 1928. Armament. 8—8-in. ; 6—4-in. A.A. ; 2 multi machine guns ; 1 catapult ; 3 aircraft.

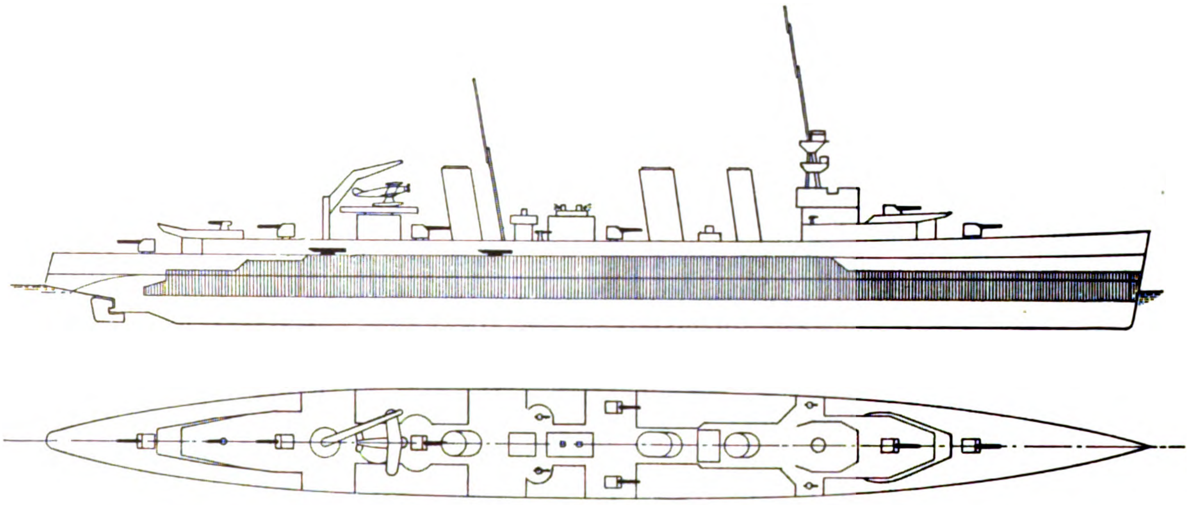
NOTE.—Berwick and Kent are now in hand for similar alterations.

GREAT BRITAIN.

CRUISERS.

"E" Class.

Emerald. **Enterprise.***



Length (extreme), 570 ft.; Length B.P., 535 ft.; Emerald, 7,550 tons; Enterprise, 7,580 tons; Speed, 33 knots.
Armament, 7—6-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 2 M.; 8 L.; 16—21-in. torpedo tubes; 1 catapult; 1 aircraft.

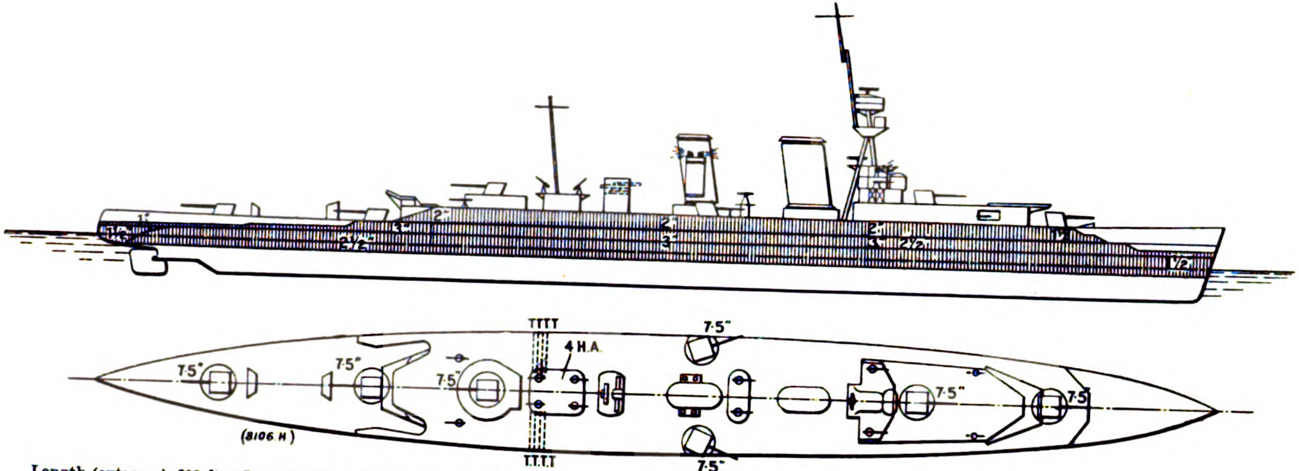
* In Enterprise the two forward 6-in. guns are mounted in a twin mounting on forecastle deck.

GREAT BRITAIN.

CRUISERS.

Improved "Birmingham" Class.

Effingham. **Hawkins.** **Frobisher.** **Vindictive.***



Length (extreme), 605 ft.; Length B.P., 565 ft.; 9,770—9,996 tons; Speed: Effingham and Frobisher 30½ knots; Vindictive 30 knots: Hawkins 29½ knots.
Armament: Effingham: 7—7·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 5 torpedo tubes. **Frobisher:** 6—7·5-in.; 2—4-in. A.A.; 4—3-pr.; 2 M.; 8 L.; 2 torpedo tubes. **Hawkins:** 7—7·5-in.; 4—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 6 torpedo tubes. Vindictive: 6—7·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 2 L.; 6 torpedo tubes.

* Vindictive has an aircraft hangar mounted forward of the bridge, and to accommodate this the raised 7·5-in. gun forward has been removed. After funnel removed and seaplane crane fitted aft.

Frobisher is now employed as Cadets' Sea-going Training Ship.

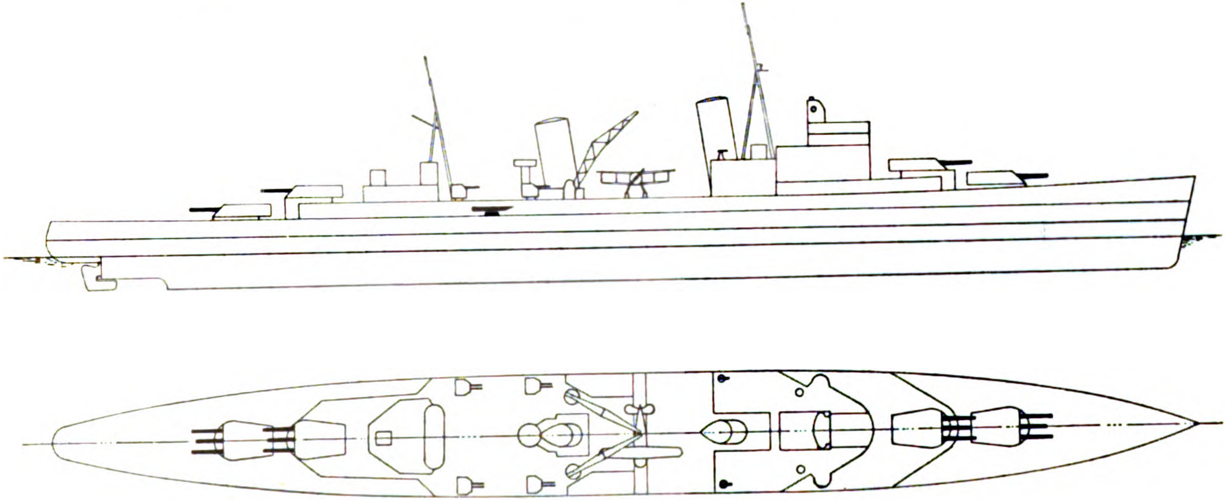
NOTE.—Under the London Naval Treaty the 7·5-in. guns have to be removed. Vindictive is being demilitarised and will be a training ship. The remaining three ships of the class are to be rearmed with 6-in. guns.

GREAT BRITAIN.

CRUISERS.

"*Southampton*" *Class.*

Southampton, Newcastle, Sheffield, Birmingham, Glasgow, Gloucester, Liverpool, Manchester.



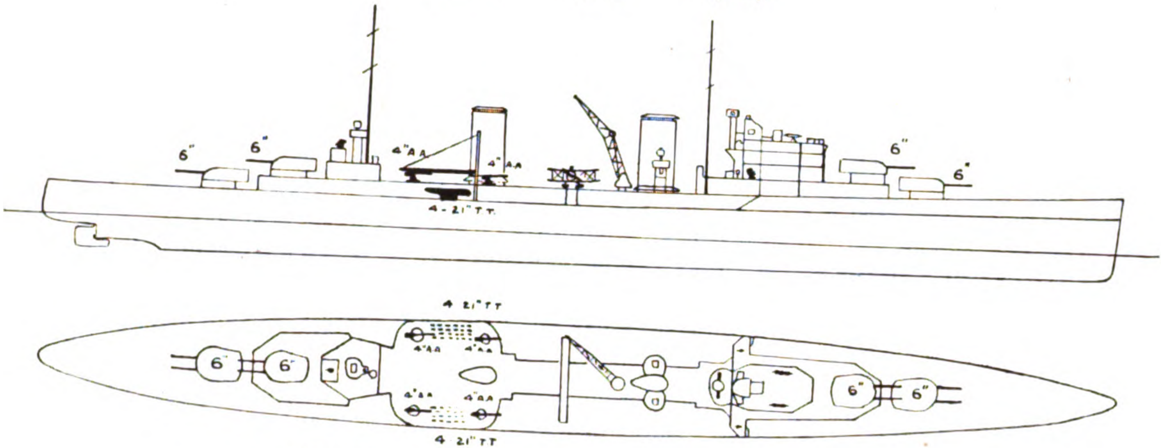
Length (extreme), 595 ft.; 9,000 tons; Speed, 32 knots; Completed, 1937.
Armament, 12—6-in.; 8—4-in. A.A.; 2—2-Pdr.; 8—21-in. torpedo tubes; 1 catapult; 3 aircraft.

GREAT BRITAIN.

CRUISERS.

"*Amphion*" *Class.*

Amphion. **Apollo.** ***Sydney.**



Displacement, 7,000 tons; Length (extreme), 560 ft.; Speed, 32½ knots.
Armament, 8—6-in; 4—4-in. A.A.: 21 smaller guns; 4 quadruple 21-in. torpedo tubes; 1 catapult; 2 aircraft.
Amphion and Apollo carry 2 aircraft and Sydney 1 aircraft. Sydney completed, 1935; Amphion and Apollo completed in 1936.

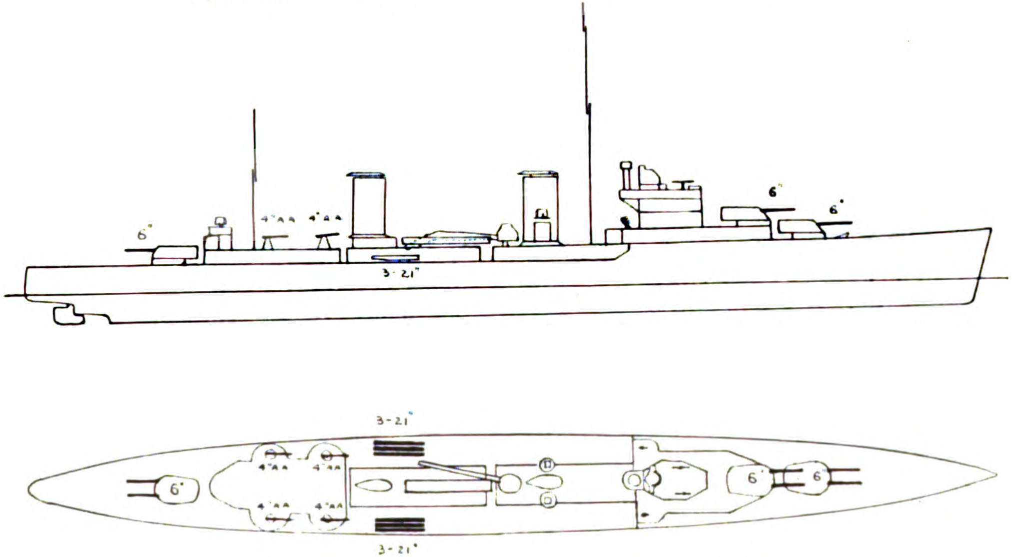
* H.M. Australian Navy.

GREAT BRITAIN.

CRUISERS

"*Arethusa*" Class.

Arethusa. **Galatea.** **Penelope.** **Aurora.**

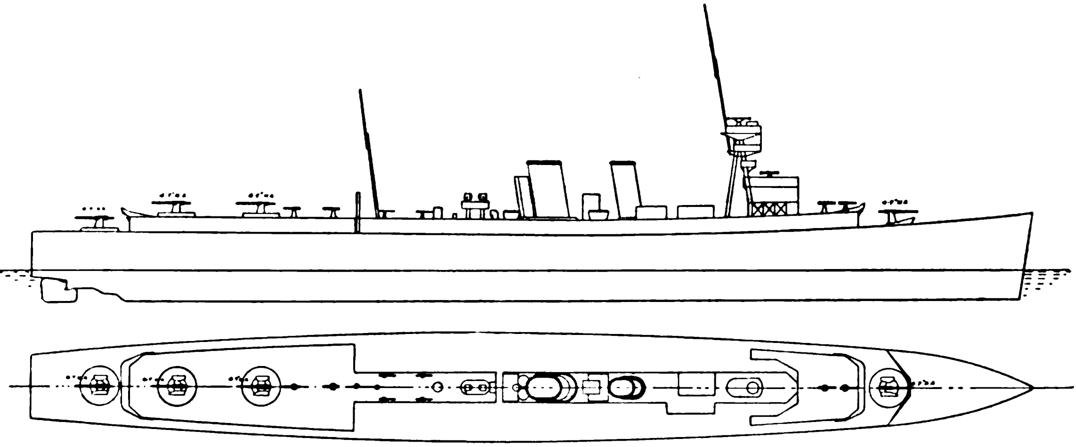


Displacement, 5,200 tons ; Length (extreme), 506 ft. ; Speed, 32¼ knots.
Armament, 6—6-in. ; 4—4-in. A.A. ; 2—3-pdr. ; 18 smaller ; 2 triple 21-in. torpedo tubes ; 1 catapult, 1 aircraft.
Arethusa and Galatea completed 1935 ; Penelope, 1936 ; Aurora building.
Aurora has 4 twin 4-in. A.A. mountings instead of singles.

GREAT BRITAIN.

CRUISER MINELAYER.

Adventure.



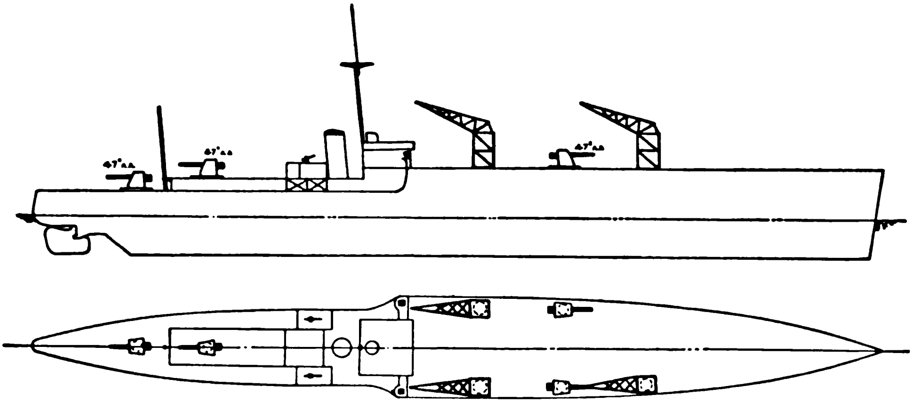
Length (extreme), 539 ft.; Length B.P., 500 ft.; 6,800 tons; Speed, 27¾ knots.
Armament, 4–4·7-in. A.A.; 4—3-pr.; 4—2-pr.; 2 M.; 8 L.; 310 mines.

Stern has been lengthened and rounded in plan. Derricks added abreast masts.

ROYAL AUSTRALIAN NAVY.

SEAPLANE CARRIER.

Albatross.



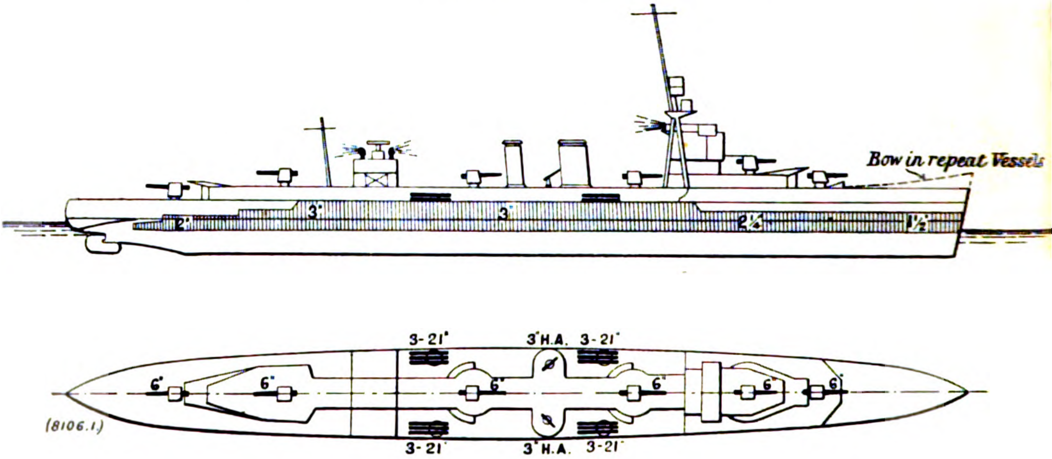
Length, 443¾ ft.; 4,800 tons; Speed, 21 knots; Completed, 1929.
Armament, 4—4·7-in. A.A.; 4—2-pdr. Pom Poms; 4—3-pdr.; 4 M.; 4 L.; 6 seaplanes.

GREAT BRITAIN

CRUISERS.

"D' Class.

***Despatch. *Diomede. Danae. Dauntless. Dragon. *Delhi. *Dunedin. *Durban.**



Length, 472¾ ft. ; 4,850 tons ; Speed, 29 knots ;
Armament, 6—6-in. ; 3—4-in. A.A. ; 4—3-pr., 2—2-pr. ; 2 M ; 8 L. ; 12—21-in. torpedo tubes.

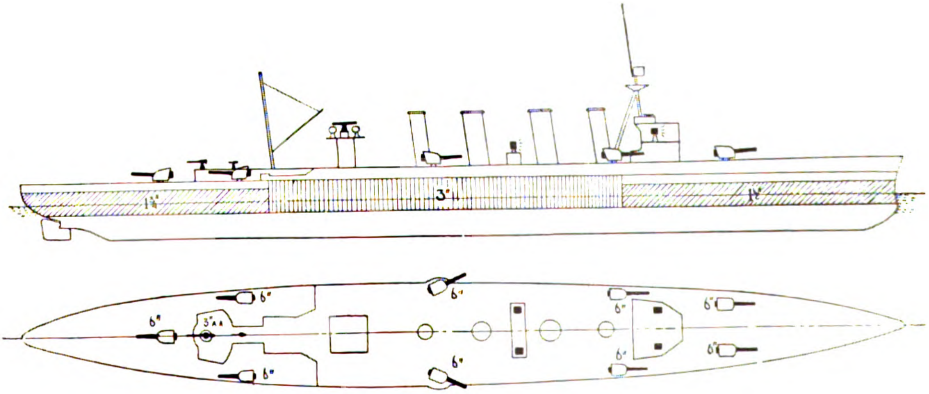
Diomede and Dunedin are attached to the New Zealand Division.

* Repeat vessels.

ROYAL AUSTRALIAN NAVY.

CRUISER.

Adelaide.



Length, 462½ ft. ; 5,100 tons ; 25 knots.
Armament, 9—6-in. ; 4—3 pr. ; 1—3-in. A.A. ; 2 submerged 21-in. torpedo tubes.

GREAT BRITAIN.

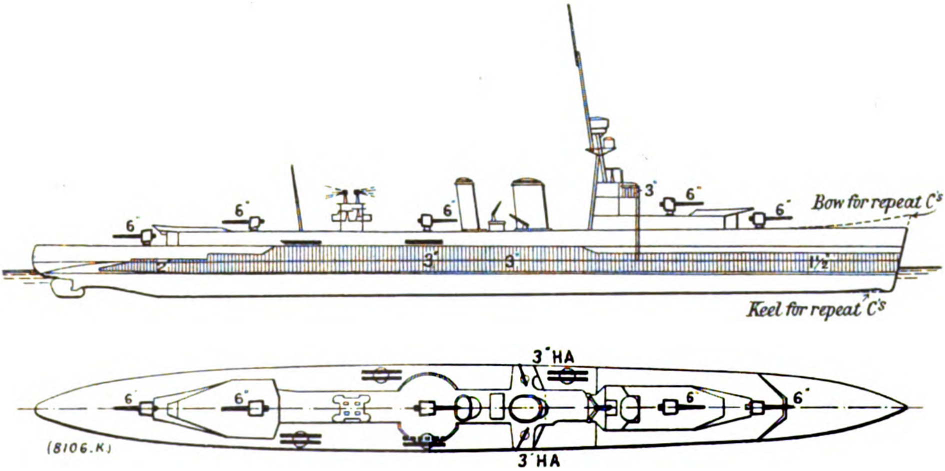
CRUISERS.

"Ceres" Class.

Ceres. **Curacoa.** **Cardiff.**

"Carlisle" Class.

***Cairo.** ***Cape Town.** ***Carlisle.** ***Colombo.** ***Calcutta.**



Length (extreme), 450 ft. (451 ft. 9 ins. Repeat Vessels); Length B.P., 425 ft.; 4,290 tons; Repeat vessels, 4,200 tons; Speed, 29 knots; Completed, 1917–18 (Repeat Vessels, 1918–22).

Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 above-water 21-in. D.R. torpedo tubes. Cardiff, Curacoa, and Ceres have 2—3-pr.

* Repeat vessels.

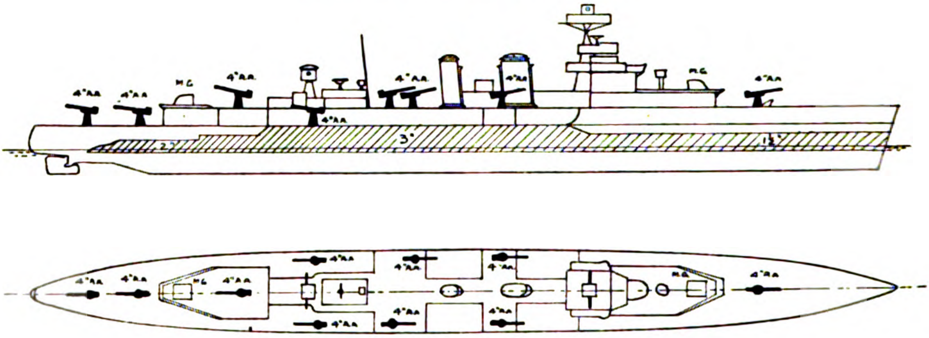
GREAT BRITAIN.

CRUISERS.

"Ceres" Class.

Coventry. **Curlew.**

Rearmed as Anti-Aircraft gun ships 1935.

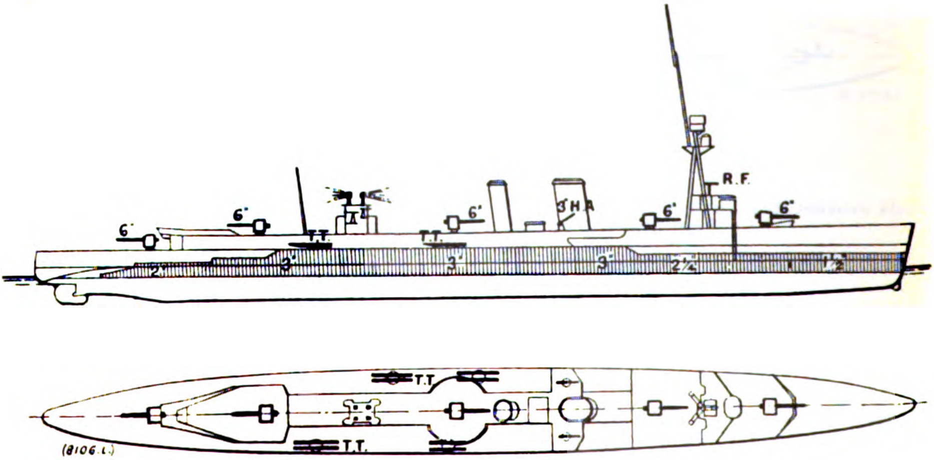


Length (extreme), 450 ft. ; 4,290 tons ; Speed, 29 knots ; Completed, 1917.
Armament, 10—4-in. A.A. ; 2—3-pdr. ; 2 multi machine guns.

CRUISERS.

"Caledon" Class.

Caledon. **Calypso.** **Caradoc.**

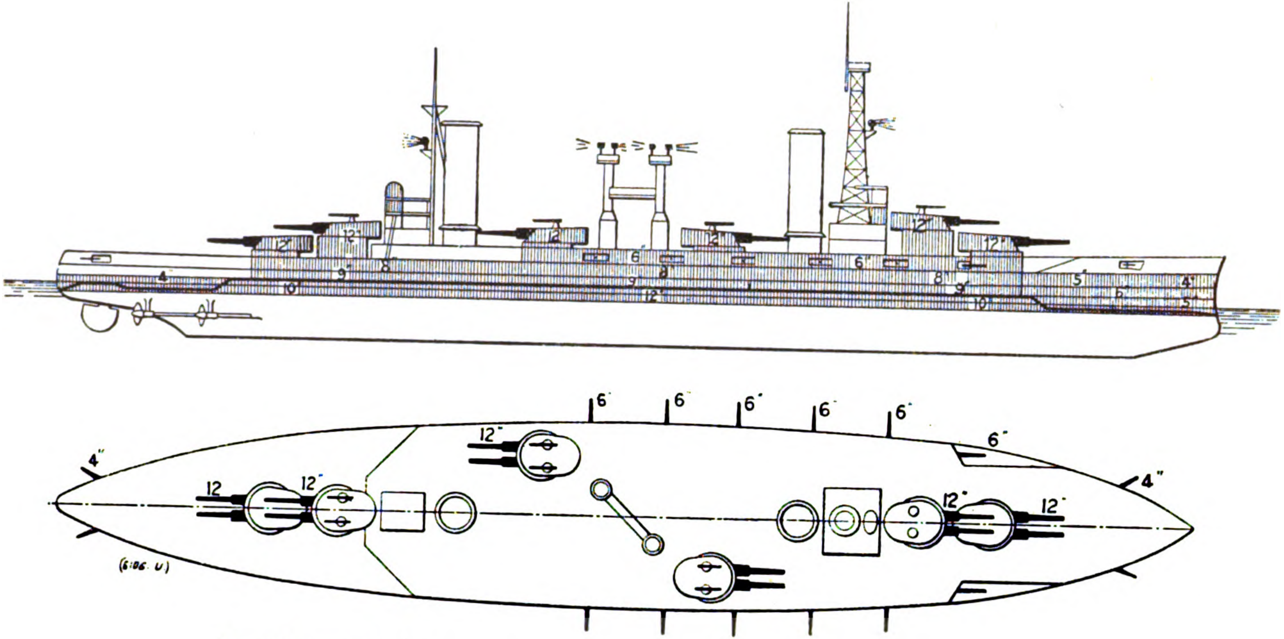


Caledon
Calypso
Caradoc } Length (extreme), 450 ft. ; Length B.P., 425 ft. ; 4,180 tons ; Speed, 29 knots ; Completed, 1917.
Armament, 5—6-in. ; 2—3-in. A.A. ; 4—3-pr. ; 2—2-pr. Pom Poms ; 2 M. ; 8 L. ; and 4 above-water 21-in. D.R. torpedo tubes.

ARGENTINE.

BATTLESHIPS.

Moreno. Rivadavia.

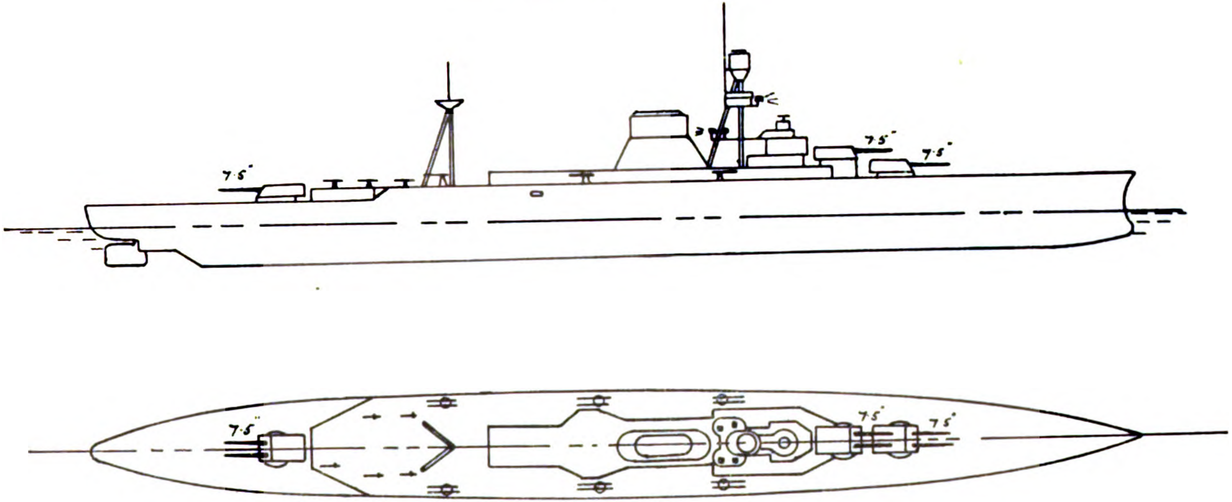


Length (extreme), 585 ft. ; Length on W.L., 575 ft. ; 27,940 tons ; Speed, 22¼ knots ; **Completed, 1914-15.**
Armament, 12—12-in. ; 12—6-in. ; 4—3-pr. ; 6 M. ; 4 L. ; 2 submerged 21-in. torpedo tubes.

ARGENTINE.

CRUISERS.

Almirante Brown. **25 Maio.**



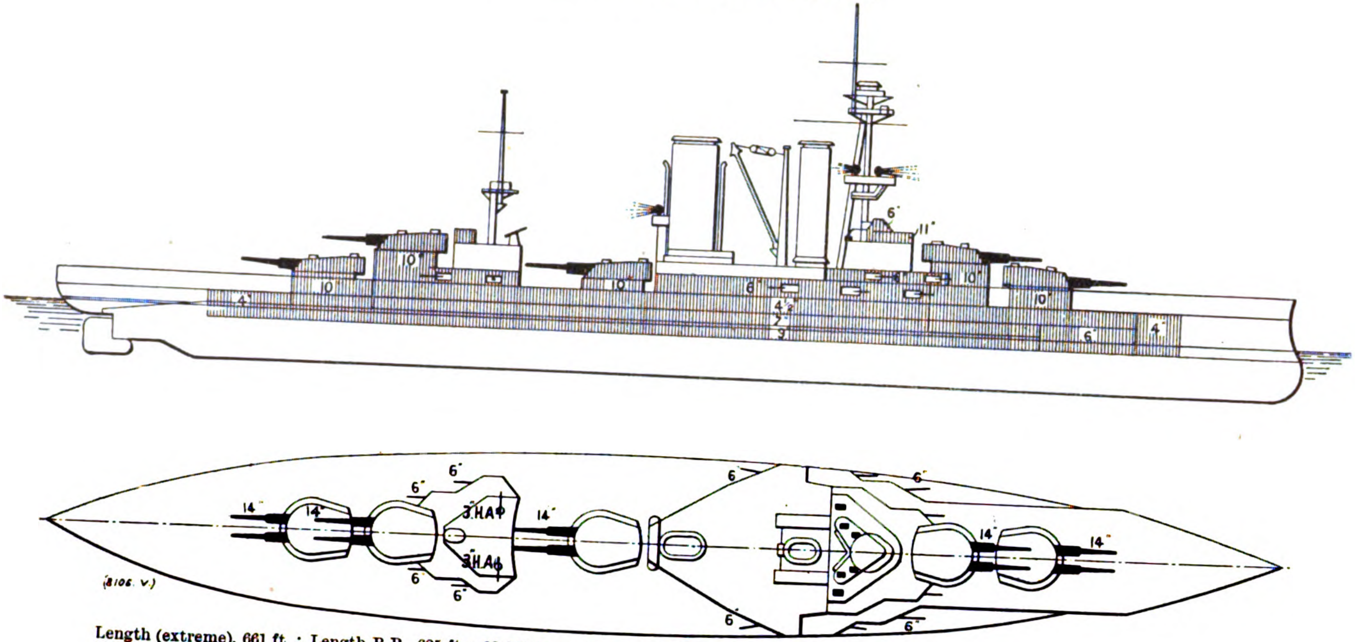
Length (extreme), 545¾ ft.; 6,495 tons; Speed, 32 knots. Completed, 1931.
Armament, 6—7·5-in.; 12—4-in. A.A.; 6 Pom Poms; 6 21-in. torpedo tubes;
1 catapult; 2 seaplanes.

Correction to plan.—Fore topmast shortened. Main topmast lengthened.

CHILE.

BATTLESHIP.

Almirante Latorre (*formerly* H.M.S. Canada).



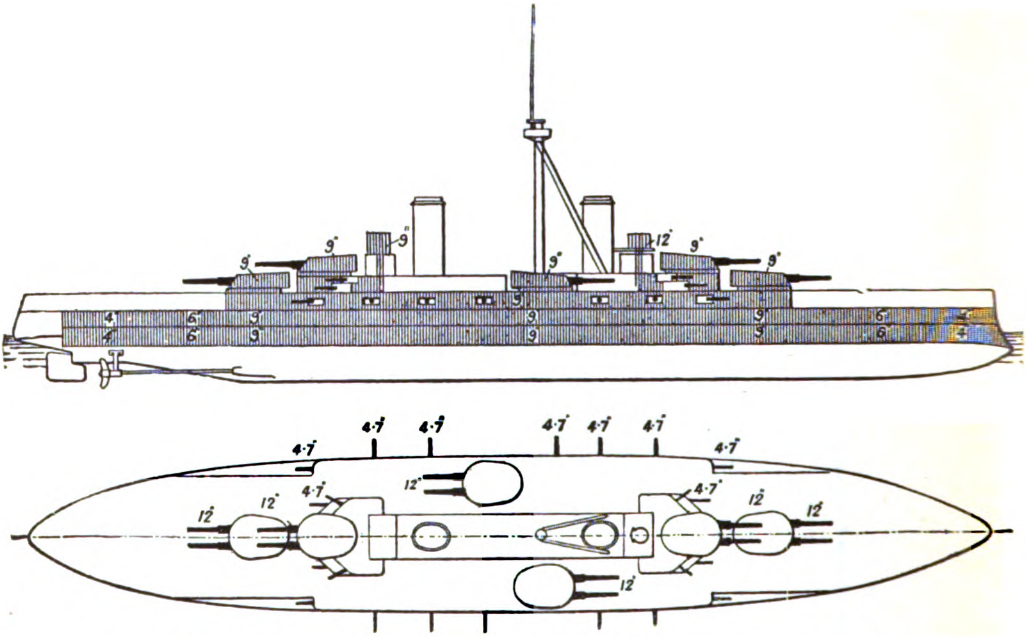
Length (extreme), 661 ft.; Length B.P., 625 ft.; 33,200 tons; Speed, 23 knots; Completed, 1915; Modernised at Devonport Dockyard, 1929–31.*
Armament, 10—14-in.; 14—6-in.; 2—3-in. A.A.; 4—3-pr.; 4 submerged 21-in. torpedo tubes; 1 catapult.

* During modernisation main topmast has been raised and bridge platforms extended.
Four 4-in. A.A. have been added.

BRAZIL.

BATTLESHIPS.

Minas Geraes. **São Paulo.**

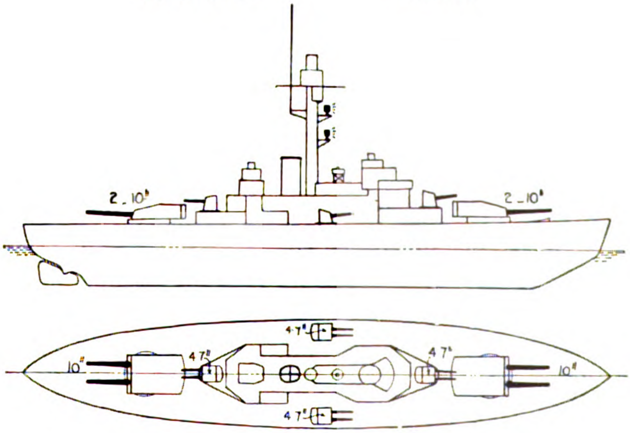


Length (extreme), 543 ft. ; Length B.P., 500 ft. ; 19,200 tons ; Speed, 21 knots ; Completed, 1909, 1910.
Armament, 12—12-in. ; 12—4·7-in. ; 6—3-pr. ; 2—3-in A.A. ; 4 M.
Overhauled and refitted at Brooklyn Navy Yard, 1921-22, and A.A. guns installed.
Corrections to plan.—Ten main deck 4·7-in. guns removed in 1931.
Minas Geraes undergoing reconstruction, 1937. Forward funnel removed and bridgework modified.

FINLAND.

ARMOURED GUNBOATS.

Väinämöinen. **Ilmarinen.**

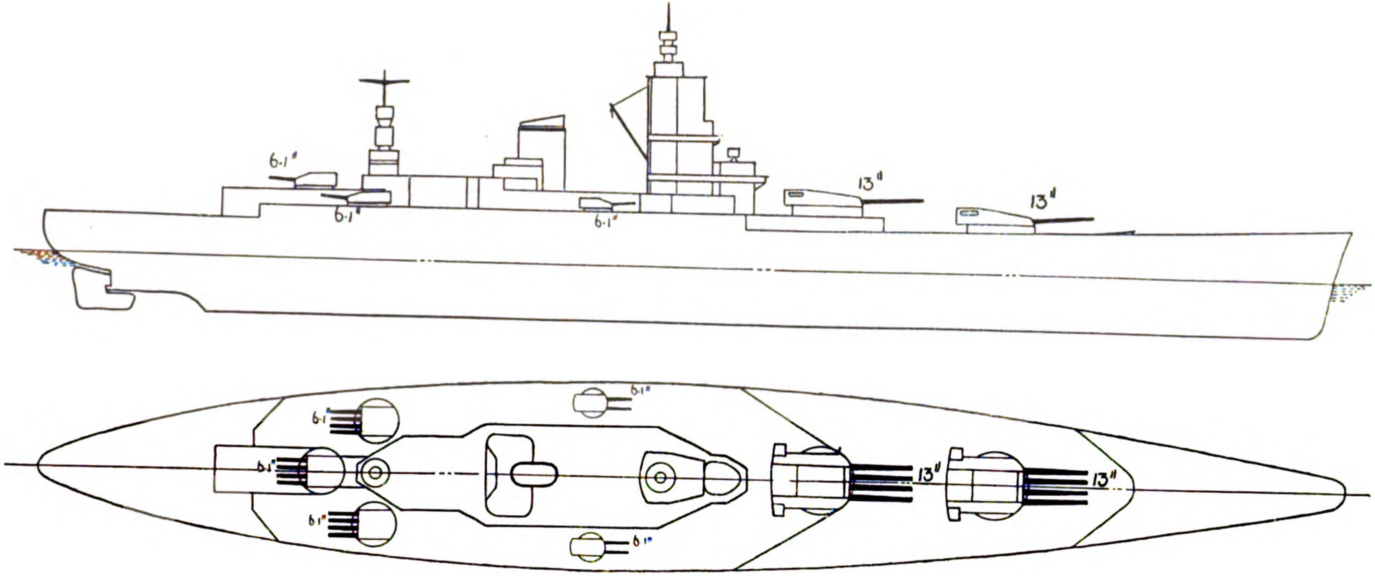


Length, 305 ft. ; 4,000 tons ; Speed, 15 knots
Armament, 4—10-in. ; 8—4-in.
Completed, 1932—33.

FRANCE.

BATTLESHIP.

Dunkerque.



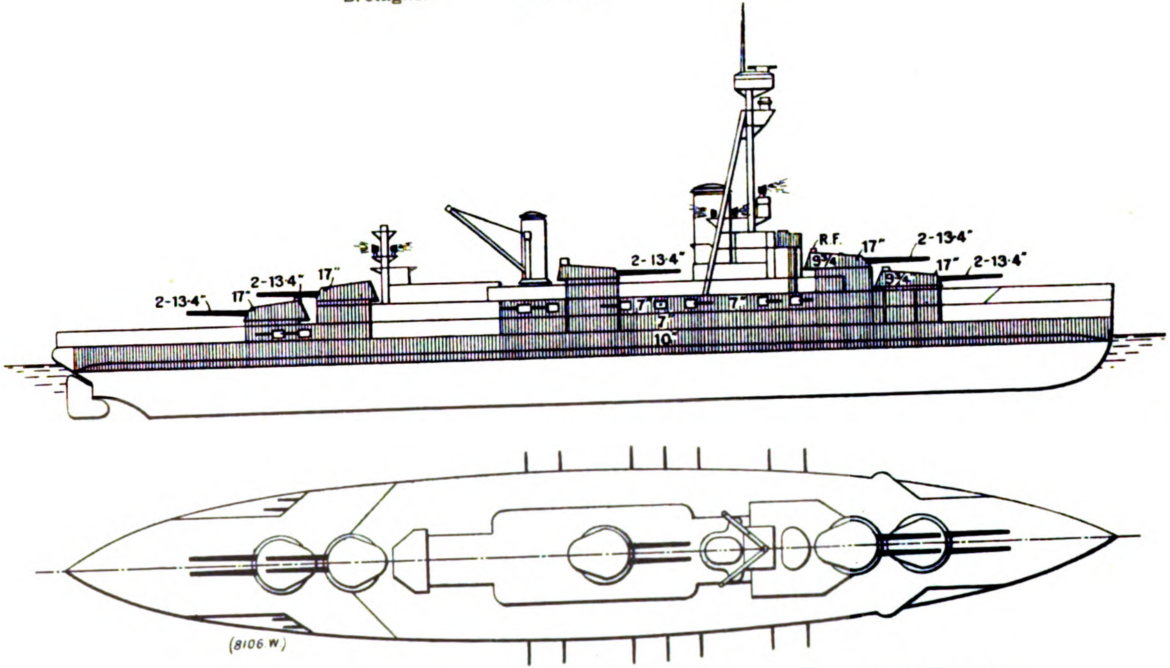
Length, 706 ft.; 26,500 tons; Speed, about 29 knots. Completed, 1936.

Armament, 8—13-in. 16—5·1-in., 40 smaller.

FRANCE.

BATTLESHIPS.

Bretagne. **Lorraine.** **Provence.**



Length (extreme), 544 ft. 6 ins.; 22,189 tons; Speed, 20 knots; Completed, 1915–16; **Modernised, 1925–27.** Converted to oil burning, 1931.

Armament, 10—13·4-in.; 14—5·4-in.; 8—3-in. A.A.; 5—3 pr.; 2—1-pr.; 4 submerged 18-in. torpedo tubes.

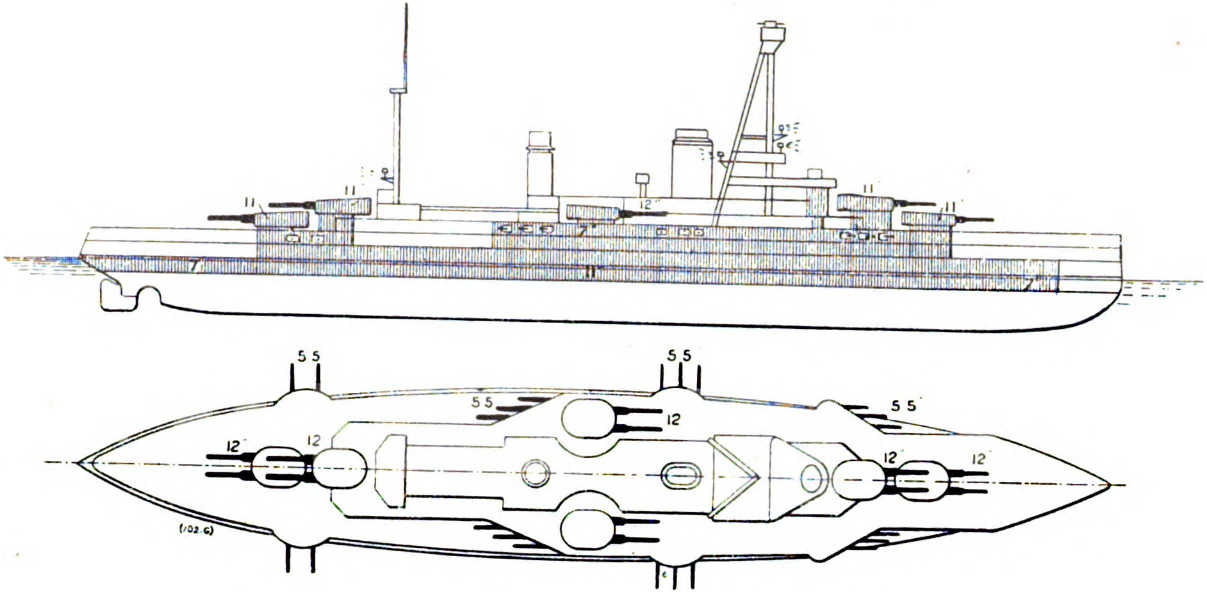
Correction to plan.—The ships have now tall main topmasts and no fore topmasts.

NOTE.—Lorraine has been reconstructed. The midships turret has been removed and a hanger fitted in its place. Machinery is being modernised and speed increased. Improved protection is being fitted. 8—3·9-in. A.A. fitted in lieu of 3-in. A.A.'s.

FRANCE.

BATTLESHIPS.

Ocean (Ex. **Jean Bart.**) **Courbet.** **Paris.**



Length (extreme), 544 ft. 6 ins.; Length B.P., 541 ft. 4 ins.; 22,189 tons; Speed, 20 knots; Completed, 1913–14. Modernised in 1929. Converted to oil burning, 1931.

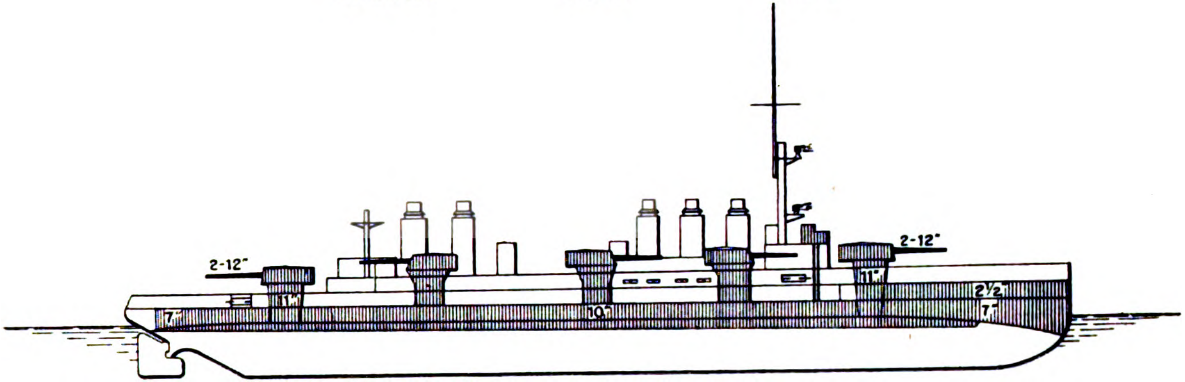
Armament, 12—12-in.; 22—5·4-in.; 7—3-in. A.A.; 4—3-pr. (Courbet has 3—3-pr.); 2—1-pr.; 4 submerged 18-in. torpedo tubes.

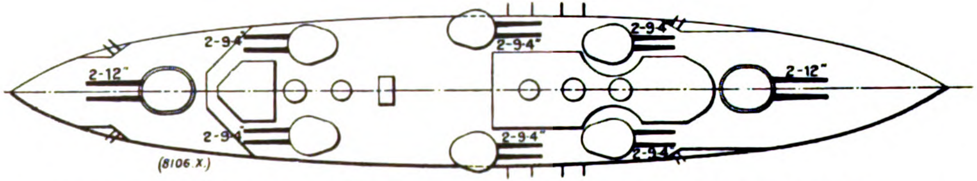
Correction to plan.—Cranes fitted abreast after funnel.

FRANCE.

BATTLESHIPS.

Condorcet. Diderot. **Voltaire.**





Length (extreme), 481 ft. ; Length W.L., 475 ft. 9 ins. ; Speed, **19¼ knots ; 17,597 tons ;** Completed, 1911.
Armament, 4—12-in. ; 12—9·4-in. ; 12—3-in. ; 2—3-in. A.A. ; 2—3-pr. A.A. (Condorcet, 4—3-pr.) ; **2—1-pr. ; 2** L. ; 2 submerged 18-in. torpedo tubes.

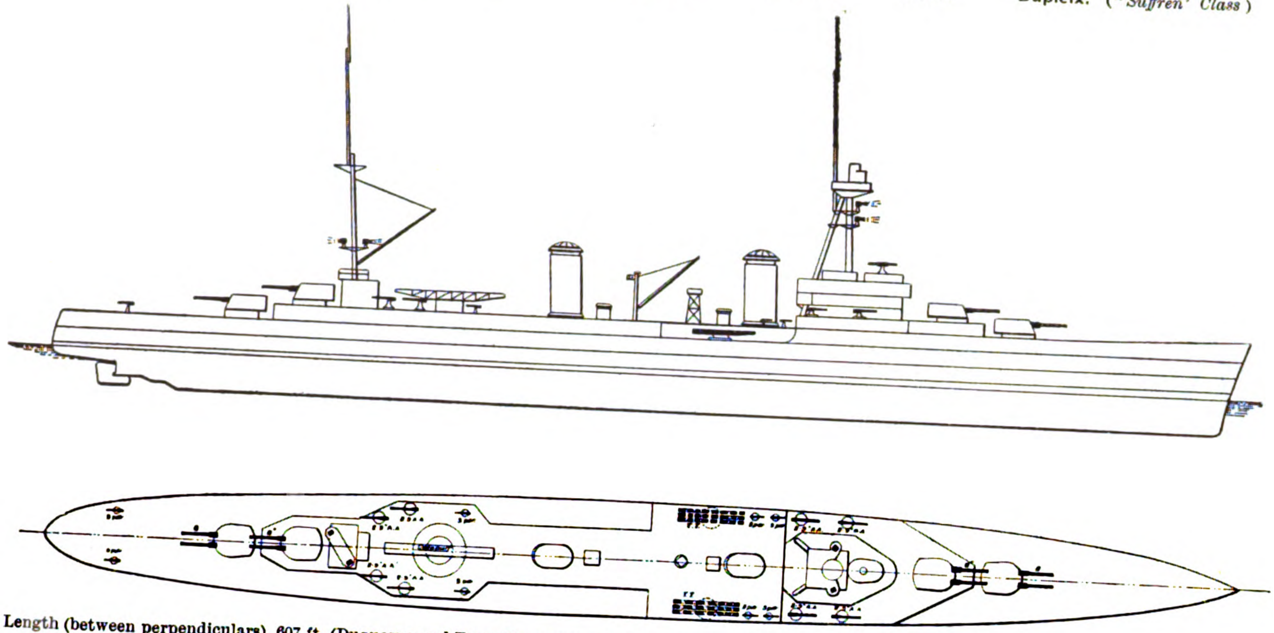
Corrections to plan.—Diderot has tall mainmast. **Two derricks fitted amidships.**

These vessels are to be scrapped.

FRANCE.

CRUISERS.

Duquesne. **Tourville.** (*"Duquesne" Class.*) **Suffren.** **Colbert.** **Foch.** **Dupleix.** (*"Suffren" Class*)



Length (between perpendiculars), 607 ft. (Duquesne and Tourville (extreme), 626 ft. 8 in.); 10,000 tons; Speed, 32 knots (Duquesne and Tourville, 33·2 knots).

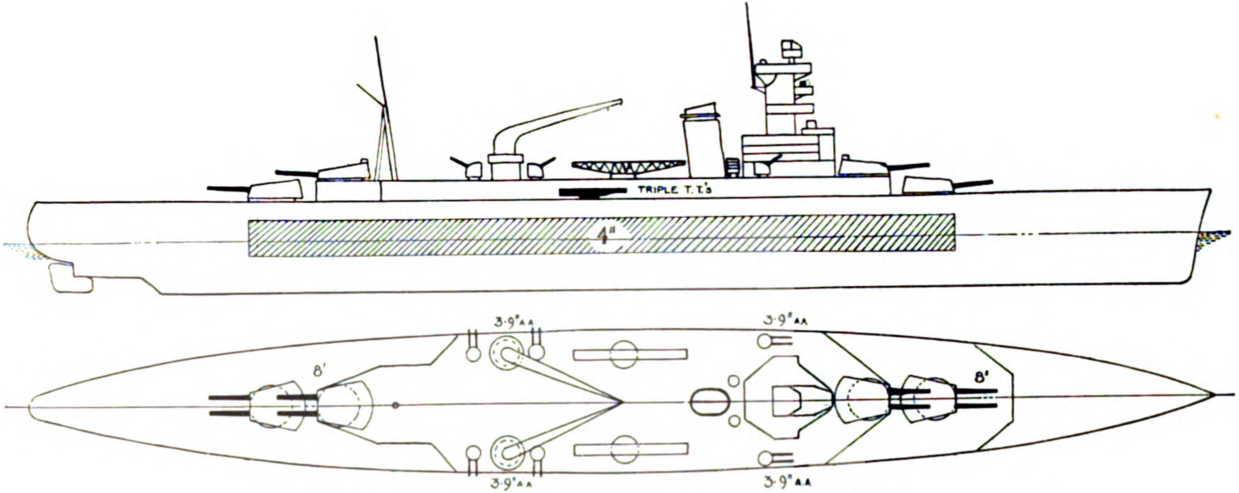
Armament, 8—8-in., 8—3-in. A.A. (Dupleix, Colbert and Foch have 8—3·5-in. A.A.); 8—1-pr.; 2—triple 21-in. T.T.'s.

The above plan is for Duquesne and Tourville. The others differ slightly from this in details of bridges, cranes, catapults, etc. **Suffren has 2 catapults in the position shown above.** Colbert, Dupleix and Foch have tripod mainmasts, 2 catapults between the funnels and the two cranes **abreast the after funnel; fore** topmasts removed in Dupleix and shortened in Duquesne, Tourville and Foch.

FRANCE.

CRUISER.

Algérie.



Length (between perpendiculars), 607 ft.; 10,000 tons; Speed, 31 knots.
Armament, 8—8-in.; 12—3·9-in. A.A.; 8—1·5-in.; 16 M.;
1 catapult; 2 seaplanes.

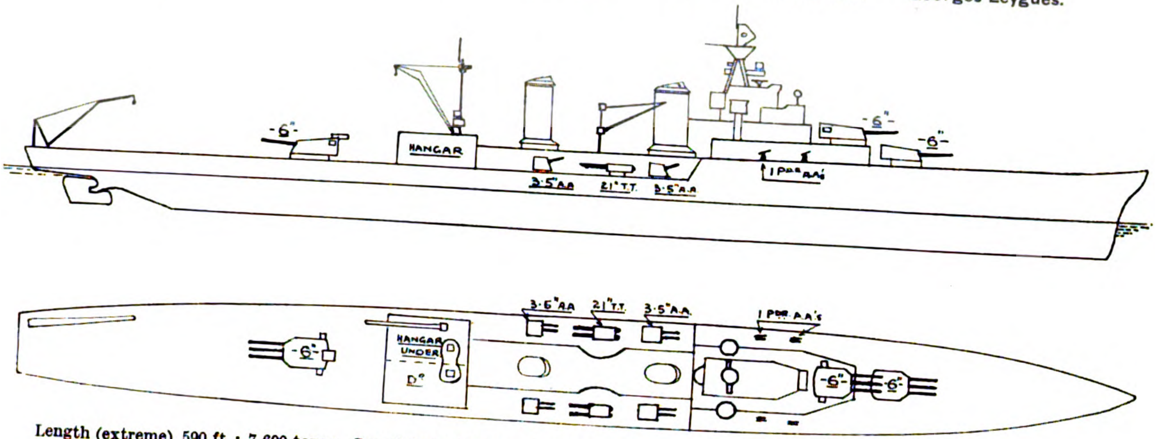
Correction to plan.—The aircraft cranes are not sided as shown, but lie fore and aft from a structure on the middle line between funnel and mainmast.

Superstructure amidships modified and two derricks fitted.

FRANCE.

CRUISERS.

Jean-de-Vienne. La Galissonnière. Marseillaise. Gloire. Montcalm. Georges Leygues.



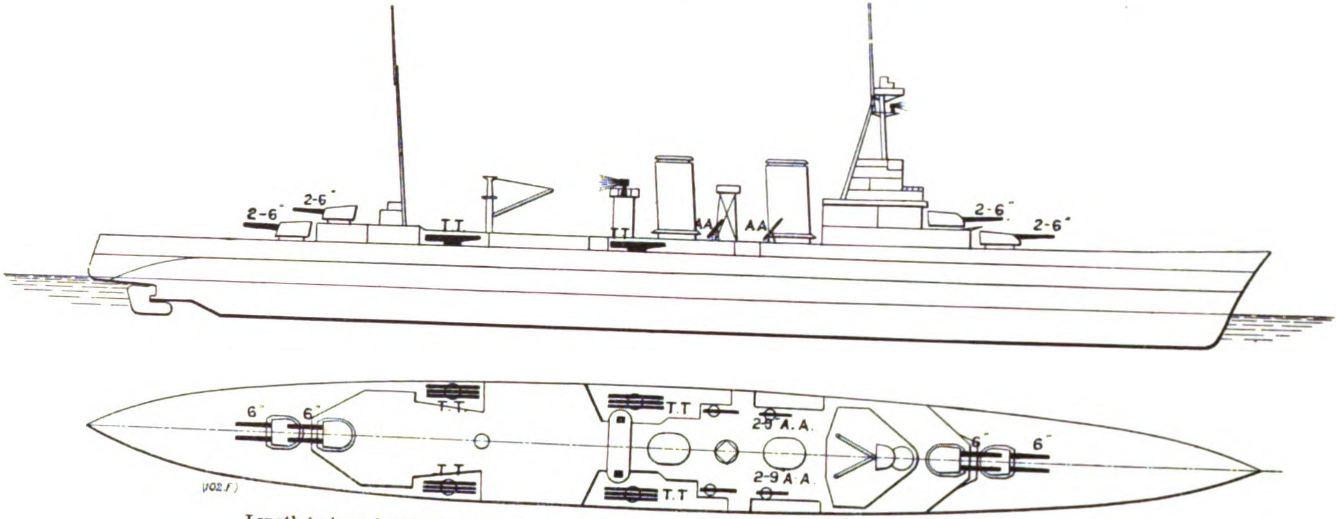
Length (extreme), 590 ft. ; 7,600 tons ; Completed, 1935-37 ; Speed, Jean-de-Vienne and La Galissonnière 31 knots, others 32½ knots.
Armament, 9—6-in. ; 8—3·5-in. A.A. ; 8—1-pdr. A.A. ; 4—21-in. torpedo tubes ; 2 seaplanes ; 1 catapult.
Fitted with Hein landing canvas at the stern.

FRANCE.

CRUISERS.

"Duguay-Trouin" Class.

La Motte Picquet. **Duguay-Trouin.** **Primauguet.**



Length (extreme), 594 ft. 10 ins.; Length B.P., 575 ft.; 7,249 tons; Speed, 33 knots. Completed, 1926–27.
Armament, 8—6·1-in.; 4—3-in. A.A.; 2—3-pr.; 2 M.; 1 L.; 4 triple torpedo tubes (21·7-in. torpedoes); catapult; 2 seaplanes.

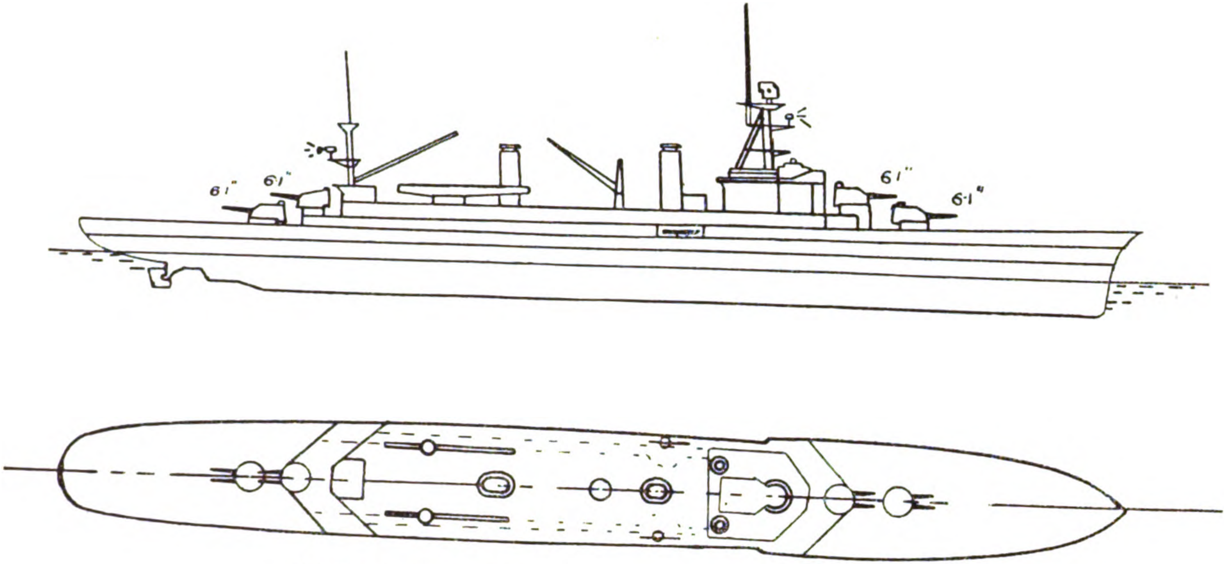
NOTE.—Reported to have protection to magazines.

Correction to plan.—Catapult is fitted on quarter deck.

FRANCE.

TRAINING CRUISER.

Jeanne d'Arc.



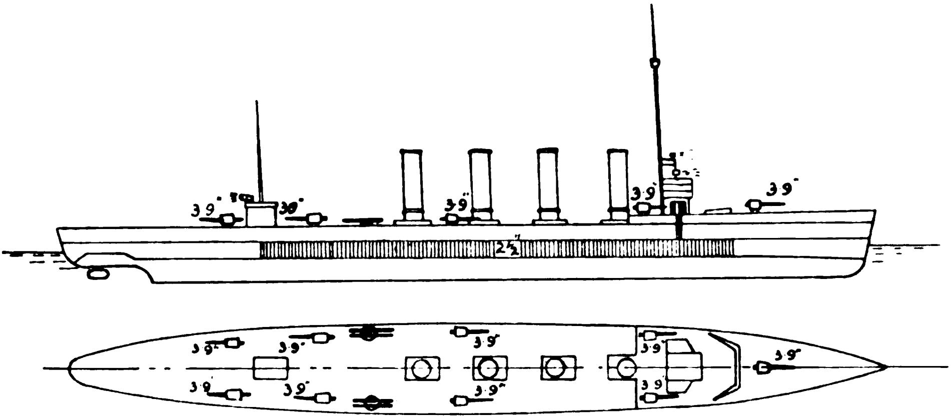
Length (extreme), 557 ft. 8 ins.; 6,496 tons; Speed, 26 knots; Completed, 1931.
Armament, 8—6·1-in.; 4—3-in. A.A.; 2—1·5-in.; 2 M.; 2—21·7-in. torpedo tubes; 2 seaplanes.

Correction to plan.—The catapults have been removed.

FRANCE.

LIGHT CRUISER.

Thionville (*ex-Austrian* Novara).

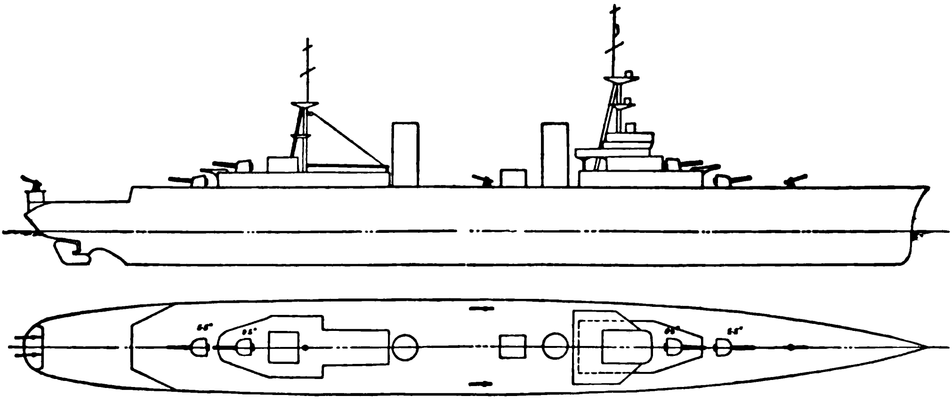


Length (extreme), 428 ft. 7 ins. ; 2,922 tons ; Speed, 27 knots.
Armament, 9—3·9-in. ; 2—3-in. A.A. ; 2 twin above-water torpedo tubes.
Correction to plan.—The torpedo tubes are fitted right aft.

FRANCE.

CRUISER MINELAYER.

Pluton.

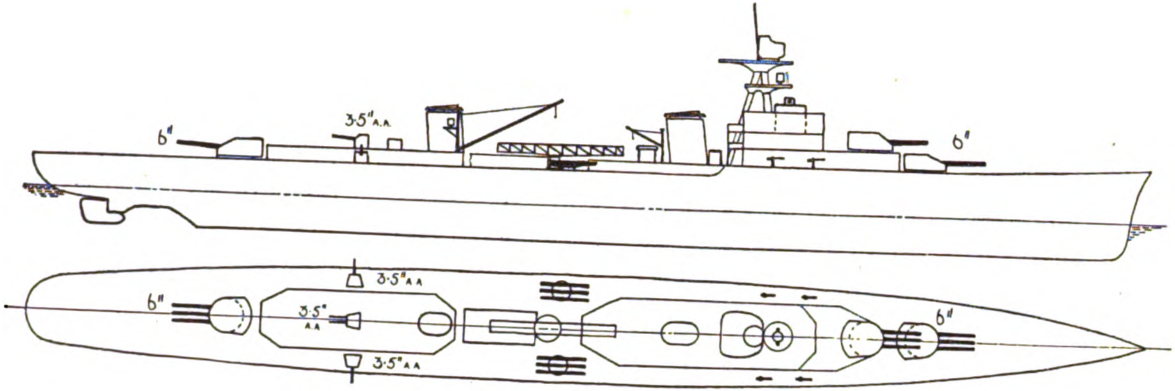


Length (between perpendiculars), 472 ft. ; 4,773 tons ; Speed, 30 knots ; Completed, 1931.
Armament, 4—5·5-in., 10—1-pdr. ; 12 M. ; 450 mines.
Correction to plan.—Fore topmast shortened.

FRANCE.

CRUISER MINELAYER.

Emilé Bertin.

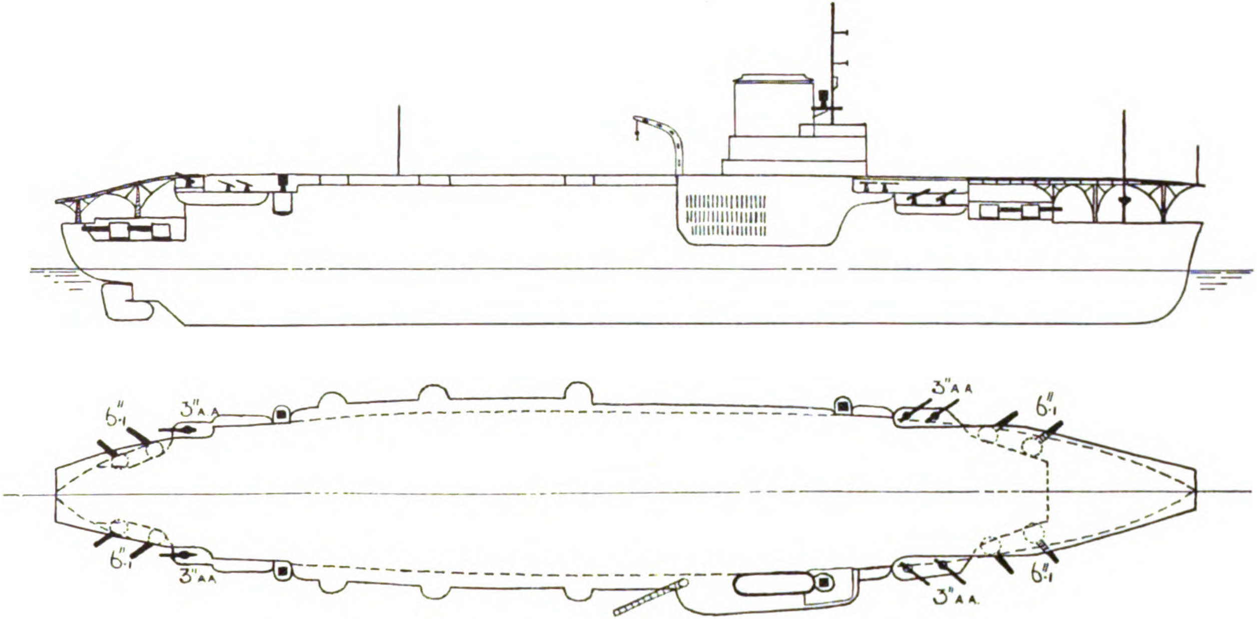


Length (extreme), 580 ft. ; 5,886 tons ; Speed, 34 knots. Completed, 1934.
Armament, 9—6-in. ; 4—3·5-in. A.A. ; 8—1-pr. ; 200 mines ; 6—21·7-in. torpedo tubes ;
1 catapult ; 2 aircraft.

FRANCE.

AIRCRAFT CARRIER.

Béarn.

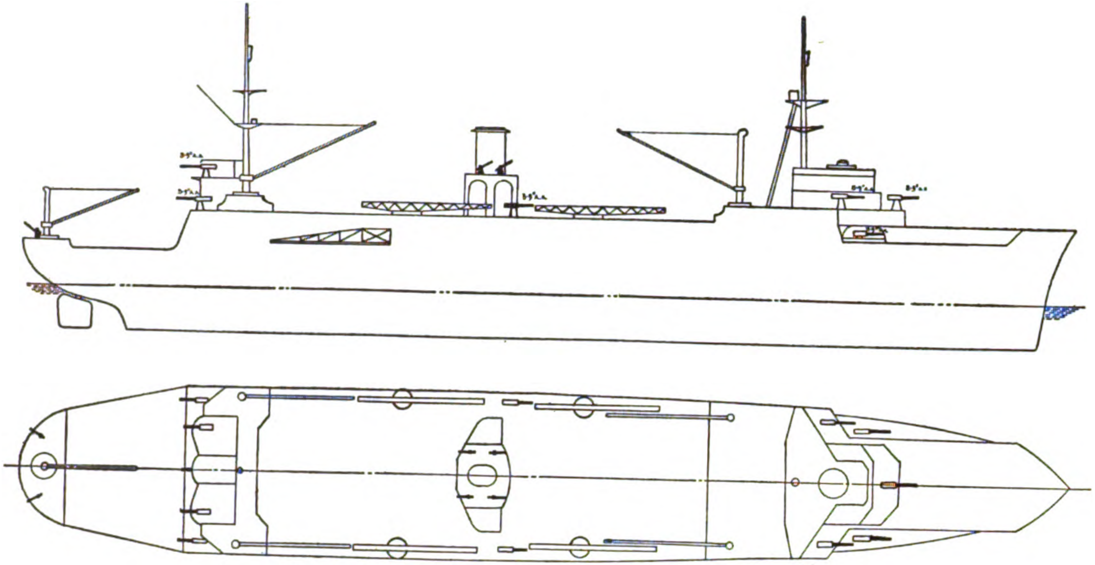


Length (extreme), 597 ft. ; 22,146 tons ; Speed, 21·5 knots ; Completed, 1928.
Armament, 8—6·1-in. ; 6—3-in. A.A. ; 8—1-pr. A.A. ; 12 M. A.A. ; 4—21·7-in. torpedo tubes ; 41 planes.

FRANCE.

AVIATION TRANSPORT.

Commandant Teste.

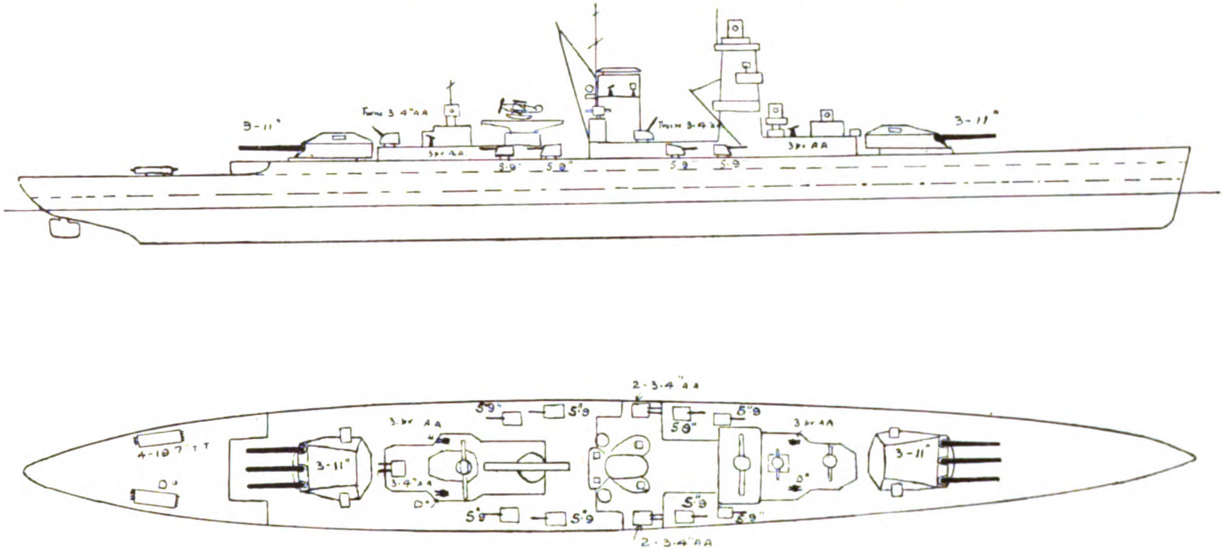


Length (extreme), 548 ft.; 10,000 tons; Speed, 20½ knots; Completed, 1932.
Armament, 12—3·9-in. A.A.; 8—3-pdr. A.A.; 12 M.; 20 planes.

GERMANY.

ARMOURED SHIPS.

Admiral Scheer. **Admiral Graf Spee.**



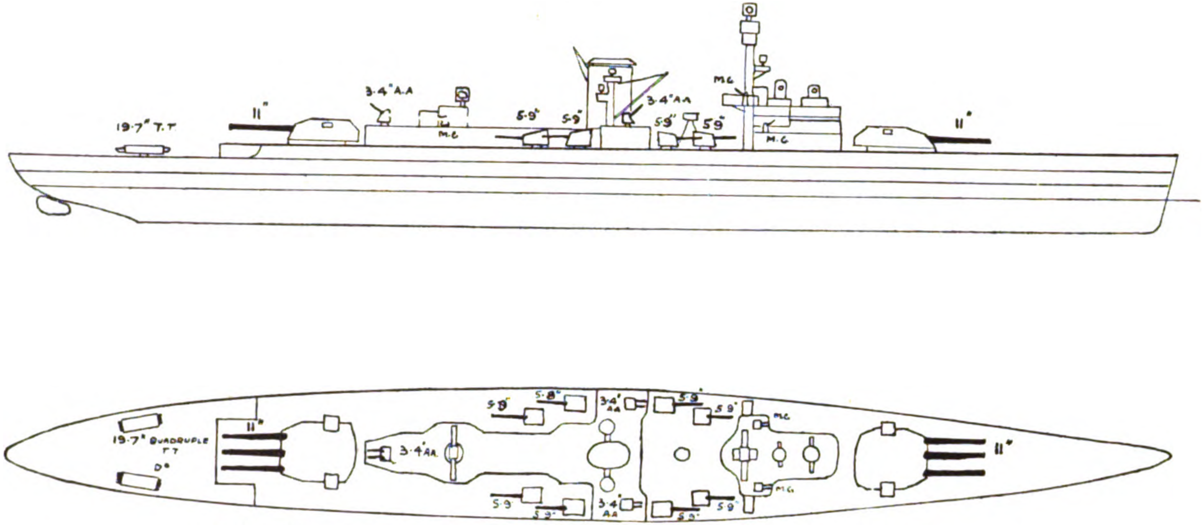
Length (extreme), 609 ft. ; Standard displacement, 10,000 tons ; Speed, 26 knots.
Armament, 6—11-in. ; 8—5·9 in. ; 6—3·4 in. A.A. ; 8 M.G. ; 8—21-in. torpedo tubes ; 1 catapult ; 2 aircraft.

Admiral Scheer completed, 1935 : Admiral Graf Spee completed, 1936.

GERMANY.

ARMOURED SHIP.

Deutschland.

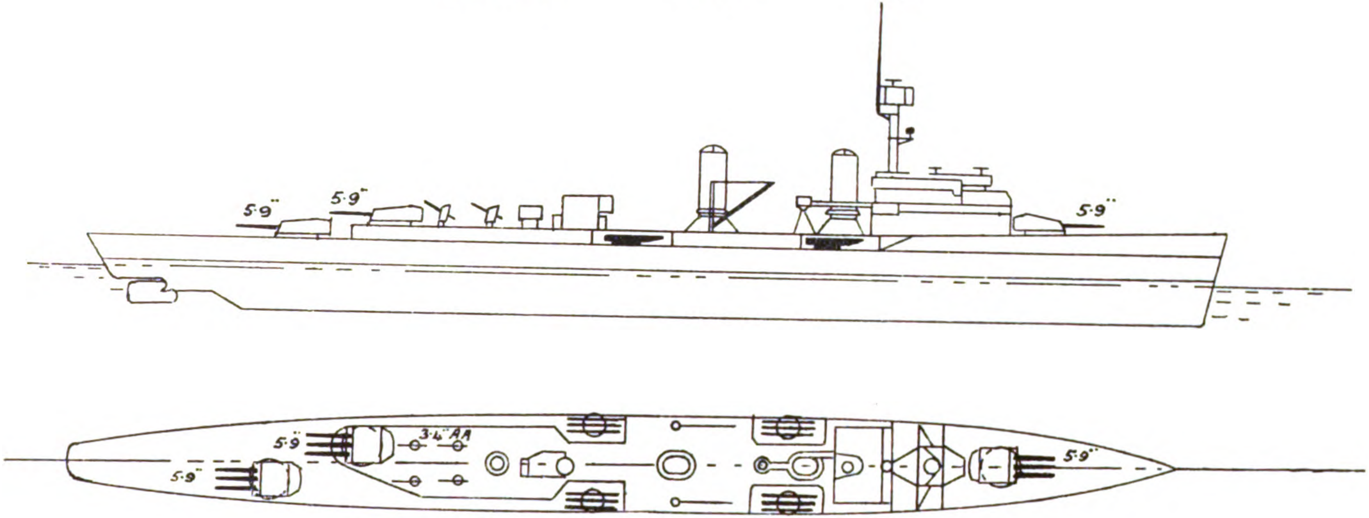


Length (extreme), 609 ft. ; Standard displacement, 10,000 tons ; Speed, 26 knots ; Completed, 1933.
Armament, 6—11-in. ; 8—5·9 in. ; 6—3·4 in. A.A. : 8 M.G. ; 8—21 in. torpedo tubes ; 1 catapult ; 2 aircraft.
Mainmast fitted on aft side of funnel. Catapult fitted abaft funnel.

GERMANY.

LIGHT CRUISERS.

Königsberg. Karlsruhe. Köln.

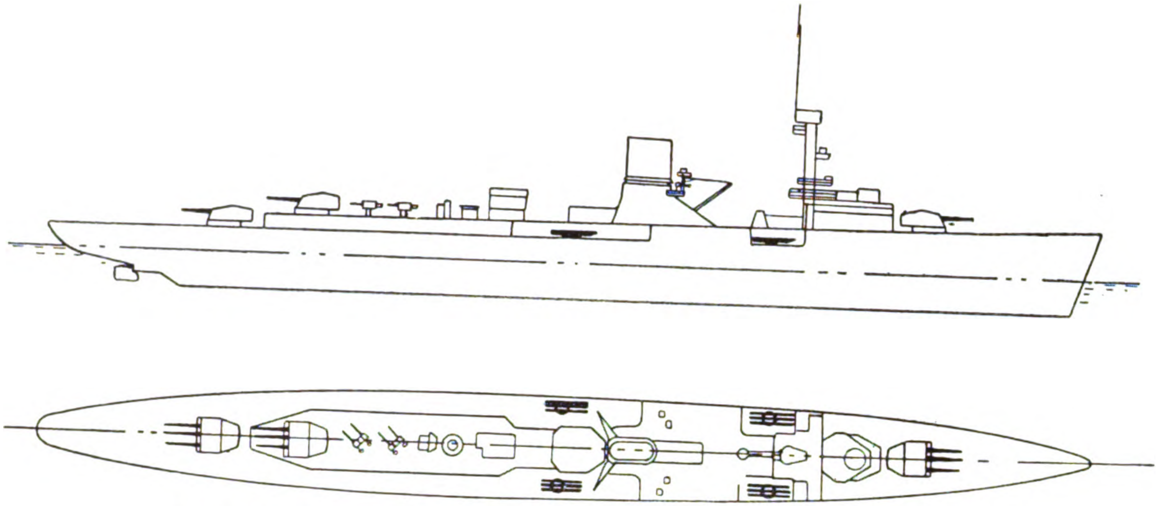


Length (extreme), 570 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1929–30.
Armament, 9—5·9-in.; 4—3·4-in. A.A.; 4 triple 21-in. torpedo tubes; 1 catapult; 2 aircraft.
Mainmast fitted on aft side of after funnel. Catapult fitted between funnels.

GERMANY.

LIGHT CRUISER,

Leipzig

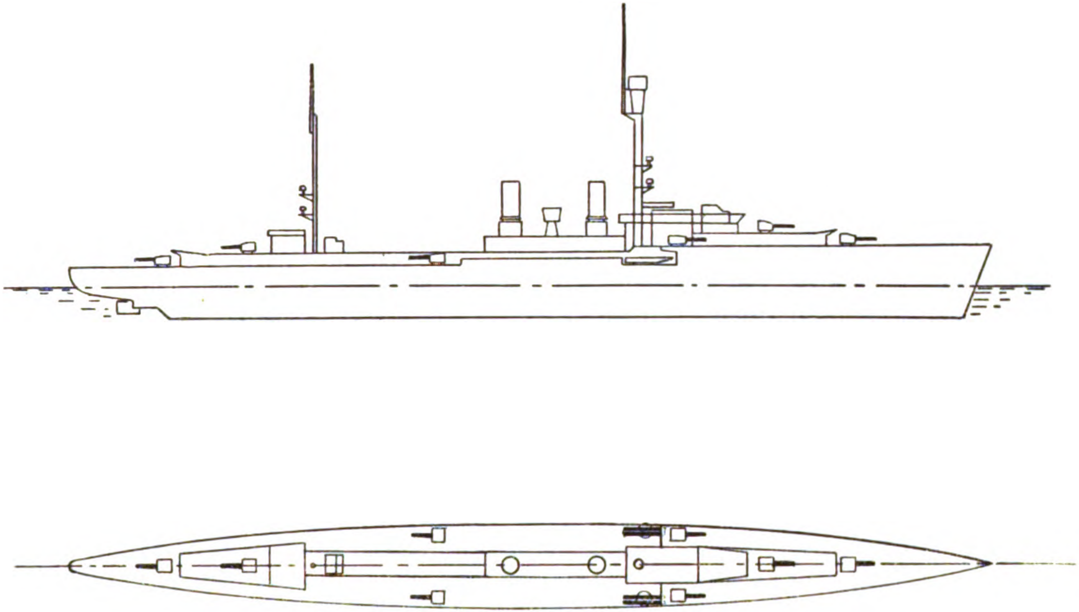


Length (extreme) 580 ft.; length W.L., 543 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1931.
Armament, 9—5·9 in.; 6—3·4 in. A.A.; 4 triple 19·7-in. torpedo tubes; 1 catapult; 2 aircraft.
Correction to plan.—Mainmast fitted on aft side of funnel. Catapult fitted between funnel and foremast.

GERMANY.

LIGHT CRUISER.

Emden.



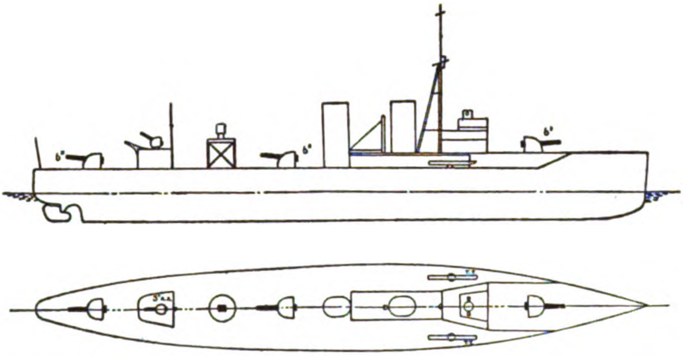
Length (extreme), 510 ft. 2 ins.; 5,400 tons; Speed, 29 knots; Completed, 1925.
Armament, 8—5·9-in.; 3—3·5-in. A.A.; 4-M.G.; 4—19·7-in. torpedo tubes in twin mountings.
The 8—5·9-in. guns will be mounted in twin mountings, 2 forward and 2 aft, when the mountings are ready.

Correction to plan.—The forward funnel is higher than the after one.

GREECE.

CRUISER.

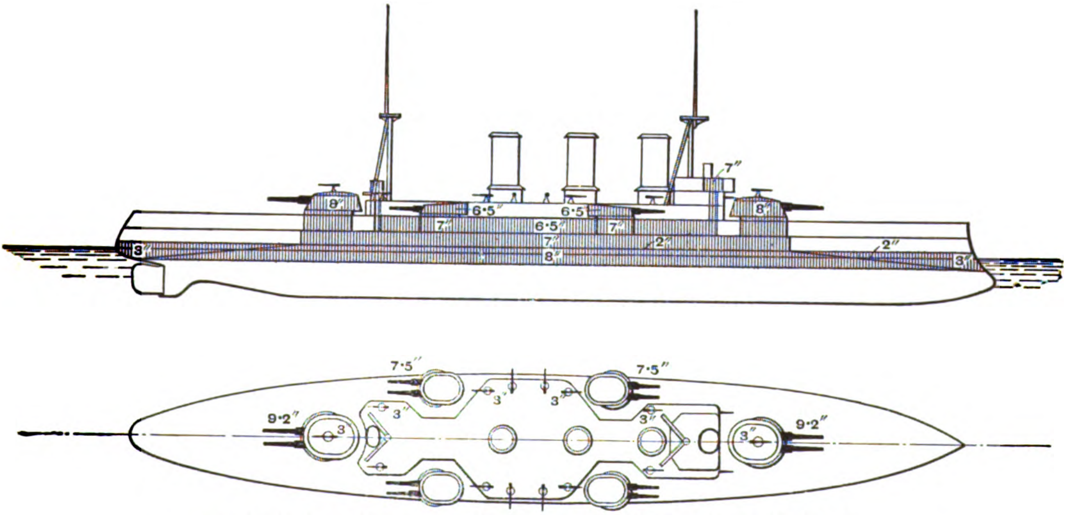
Helle.



Length, 322 ft. ; 2,083 tons ; Speed, 20 knots ; Completed, 1914 ; Reconstructed, 1929.
Armament, 3—6-in. ; 1—3-in. A.A. ; 110 mines ; 2—18-in. torpedo tubes.

ARMOURED CRUISER.

Giorgios Averoff.

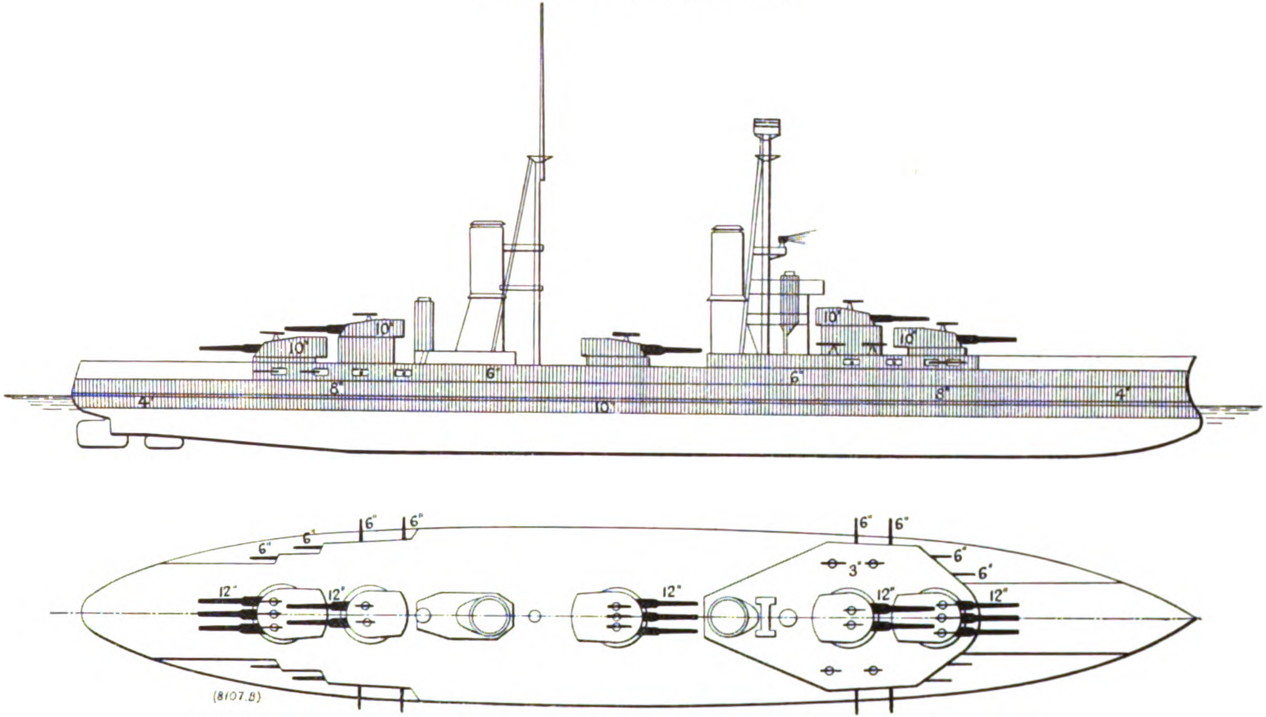


Length, 462 ft. ; 9,301 tons ; Speed, 22·5 knots ; Completed, 1911. Refitted, 1927.
Armament, 4—9·2-in. ; 8—7·5-in. ; 16—3-in. ; 2—3-in. A.A. ; 4—3-pr. ; 2 M. ; 3 submerged 18-in. torpedo tubes.
Correction to plan.—Bridgework modified.

ITALY

BATTLESHIPS.

Andrea Doria. Before modernisation. **Caio Duilio.** See note below.



Length (extreme), 575 ft. 9 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; 21,555 tons ; Completed, 1915.

Armament, 13—12-in. ; 16—6-in. ; 13—3-in. (3 of these are temporarily removed) ; 6—3-in. A.A. ; 2—2-pr. ; 6 M. ; 4 L. ; 2—18-in. torpedo tubes ; 1 aircraft.

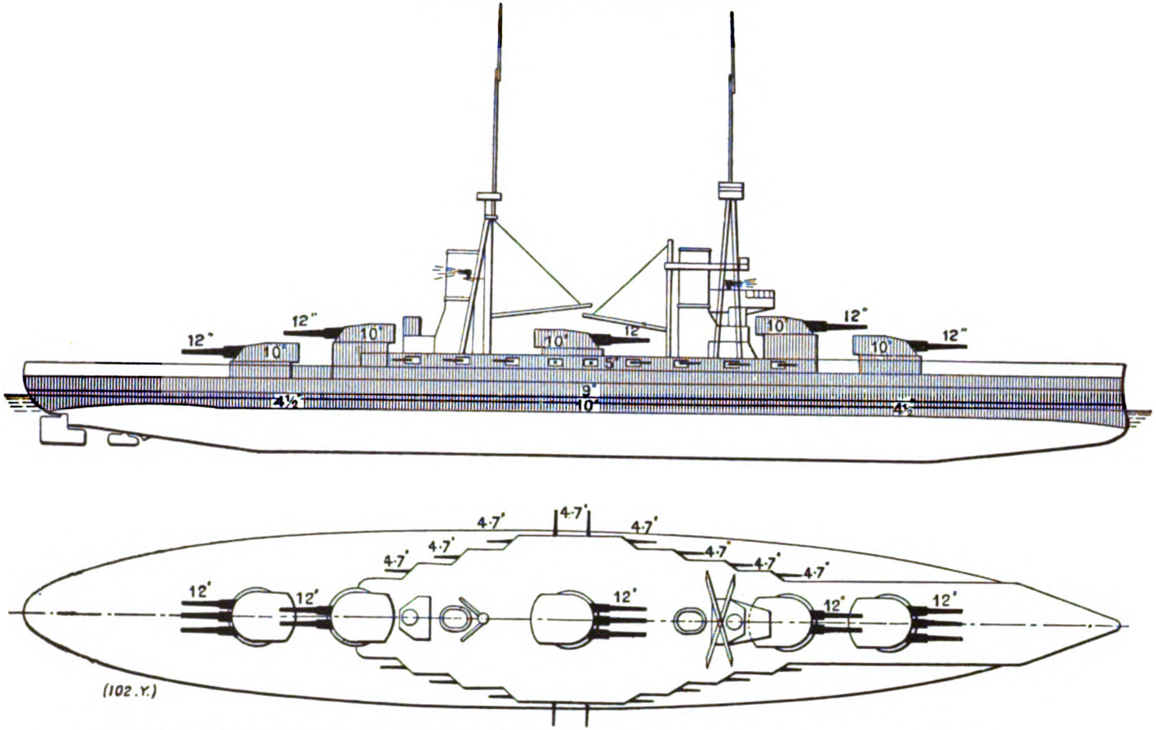
NOTE.—These vessels are being reconstructed. The bow is being lengthened by 32 ft., and the amidships turret is being removed. New propelling machinery is being installed to give over 27 knots, and 2 catapults fitted.

ITALY.

BATTLESHIPS.

Conte di Cavour. **Giulio Cesare**

Before modernisation. See note below.



Length (extreme), 577 ft. 4 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; 23,622 tons ; Completed, 1914-1915.
Armament, 13—12-in. ; 18—4·7-in. ; 13—3-in. (3 of these are temporarily removed) ; 6—3-in. A.A. ; 2—2-pr. ; 2 M. ; 4 L. ; 4 aircraft.
A fixed catapult is mounted on port side of Forecastle Deck forward.

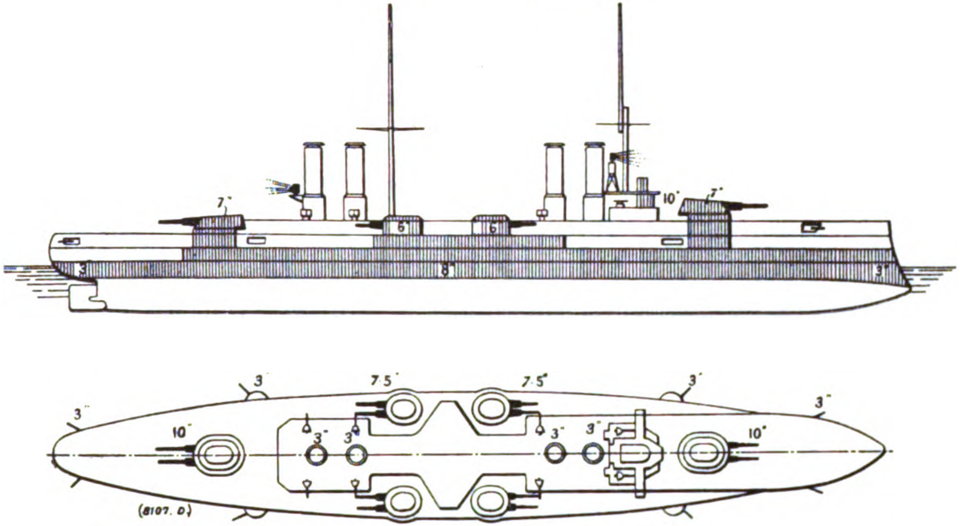
NOTE.—These vessels are being reconstructed. Bow is being lengthened by 36 ft., amidships turret removed, new propelling machinery to give a speed of more than 27 knots and 2 catapults are to be fitted.

Modified armament is 10—12·6-in. ; 12— 4·7-in. ; 8—3·9-in. A.A. 20 smaller A.A. guns.

ITALY.

CRUISERS.*

S. Giorgio. **S. Marco.**



Length (extreme), 462 ft. 2 ins.; Length B.P., 429 ft. 10 ins.;
Speed, 22·5 and 23 knots; 9,232 and 9,350 tons; Completed, 1910 and 1911.
Armament, 4—10-in.; 8—7·5-in.; 10—3-in.; 6—3-in. A.A.; 2—3-pr.; 6 M.; 2 L.; 2—18-in. torpedo tubes.

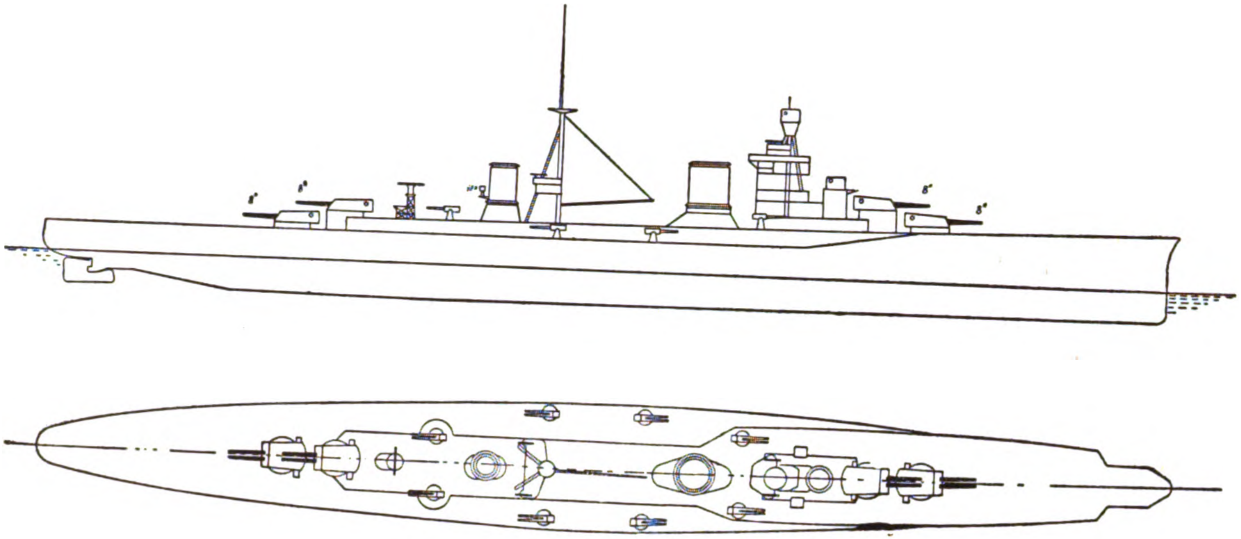
* Classified as Battleships, 2nd class, in Italian official tests.

ITALY.

CRUISER.

Modified "Trento" Class.

Bolzano.



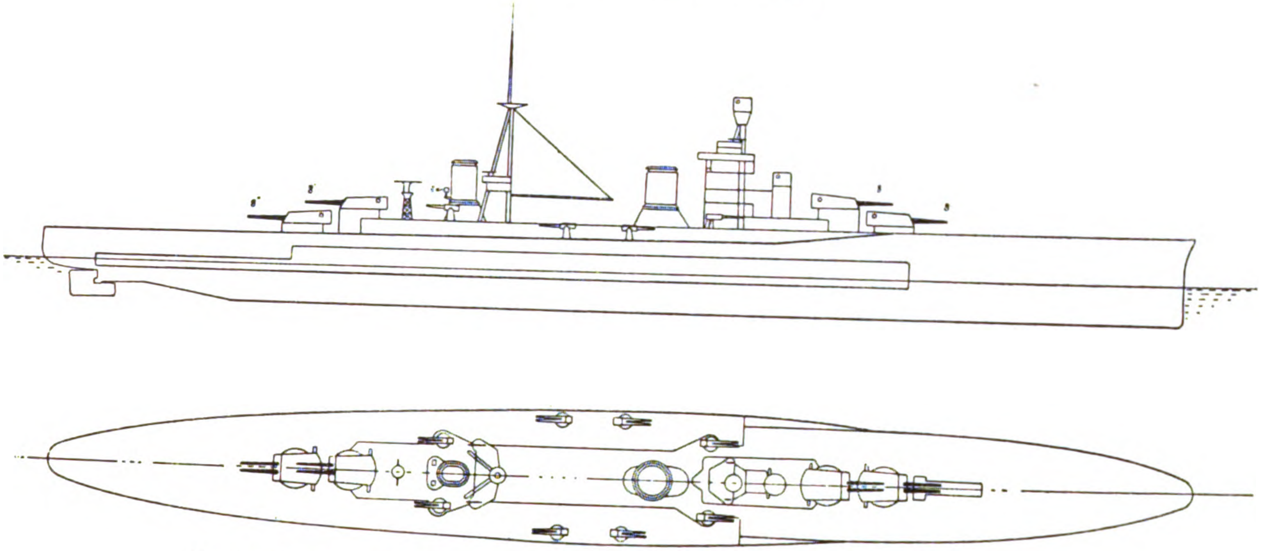
Length B.P., 644 ft.; 10,000 tons; Completed, 1932.
Armament, 8—8-ins.; 16—3·9-in. A.A.; 12 smaller; 1 catapult; 2 aircraft; 4—21-in. torpedo tubes.
Correction to plan.—Forward superstructure modified.

ITALY.

CRUISERS.

"Zara" Class.

Pola. **Zara.** **Fiume.** **Gorizia.**



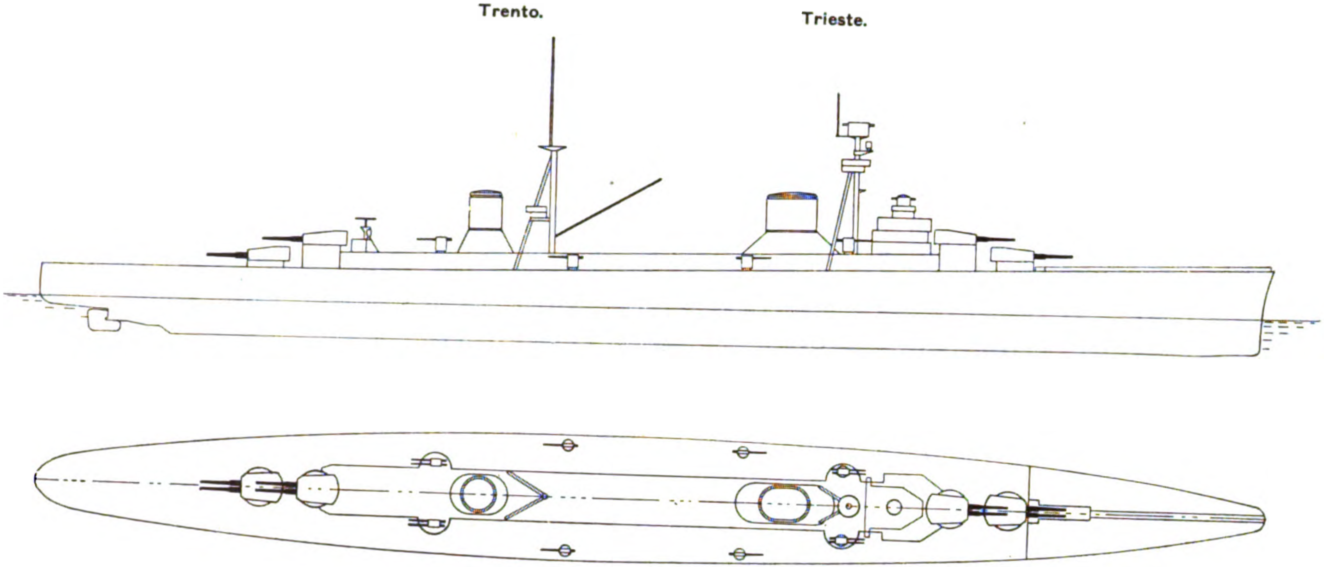
Length: Zara and Fiume, 599 ft. 5 ins.; Pola, 600 ft.; Gorizia, 590 ft. 9 ins.; 10,000 tons; Speed, 32 knots.
Armament, 8—8-in.; 16—3·9-in.; 12 smaller.
1 catapult; 2 aircraft.

Correction to plan.—Forward superstructure modified.

ITALY.

CRUISERS.

"Trento" Class.



Length (extreme), 646 ft. 2 ins.; 10,000 tons; Speed, 35 knots; Completed, 1929.
Armament, 8—8-in.; 16—3·9-in.; 4—1·57-in. A.A.; 8 M.G.; 4 twin torpedo tubes;
1 catapult; 2 aircraft.

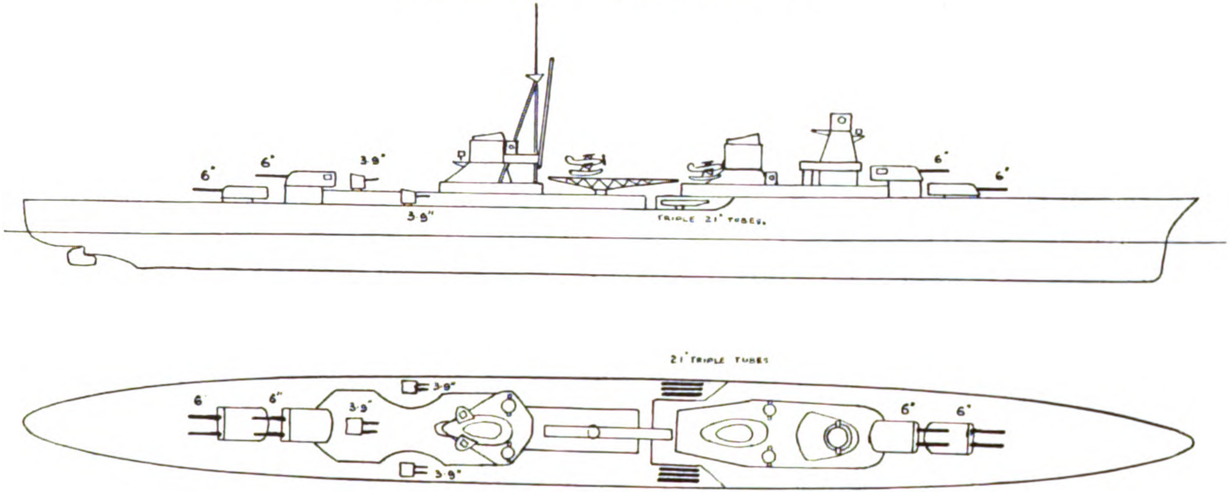
Correction to plan.—The 4-in. guns between the funnels are twin guns. Fore topmast removed.

ITALY.

CRUISERS.

"Attendolo" Class.

Eugenio di Savoia and Filiberto Duca d'Aosta.



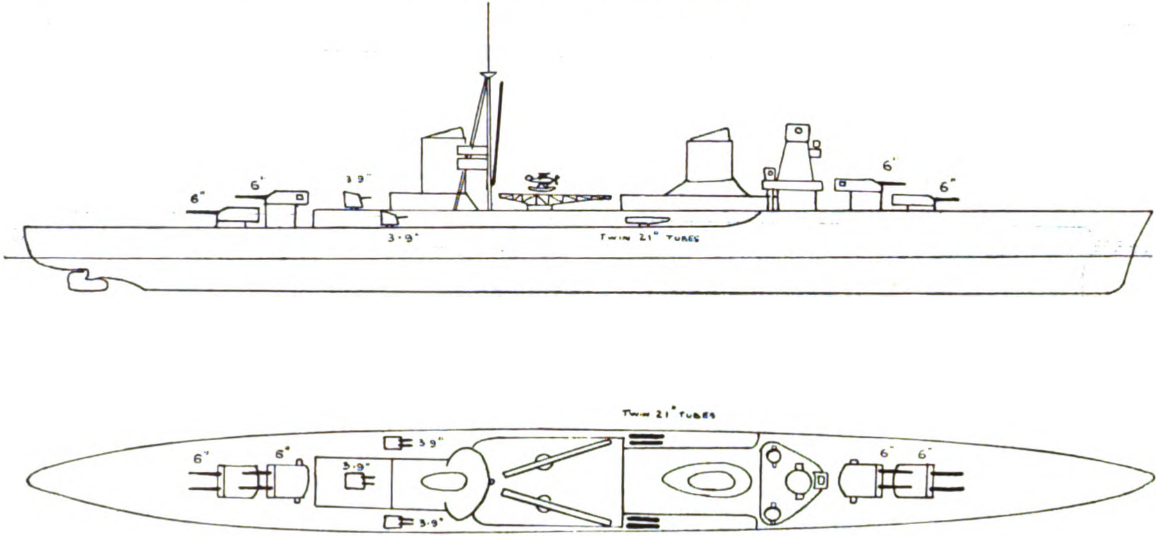
Length (extreme), 610 ft. 3 ins.; 7,283 tons; Speed. 36½ knots.
Armament, 8—6-in.; 6–3·9 in.; 8–1·5-in A.A.; 8 M.G.; 2 triple 21-in. torpedo tubes; 1 catapult; 3 aircraft.

ITALY.

CRUISERS

"Condottieri" Class.

Montecucculi and Muzio Attendolo.



Length (extreme), 597 ft. 9 ins.; 6,941 tons; Speed, 37 knots: Completed, 1935.

Armament, 8—6-in.; 6—3·9-in. A.A.; 8—1·5-in. A.A.; 8 M.G.; 2 twin 21-in. torpedo tubes; 1 catapult; 2 aircraft.

ITALY.

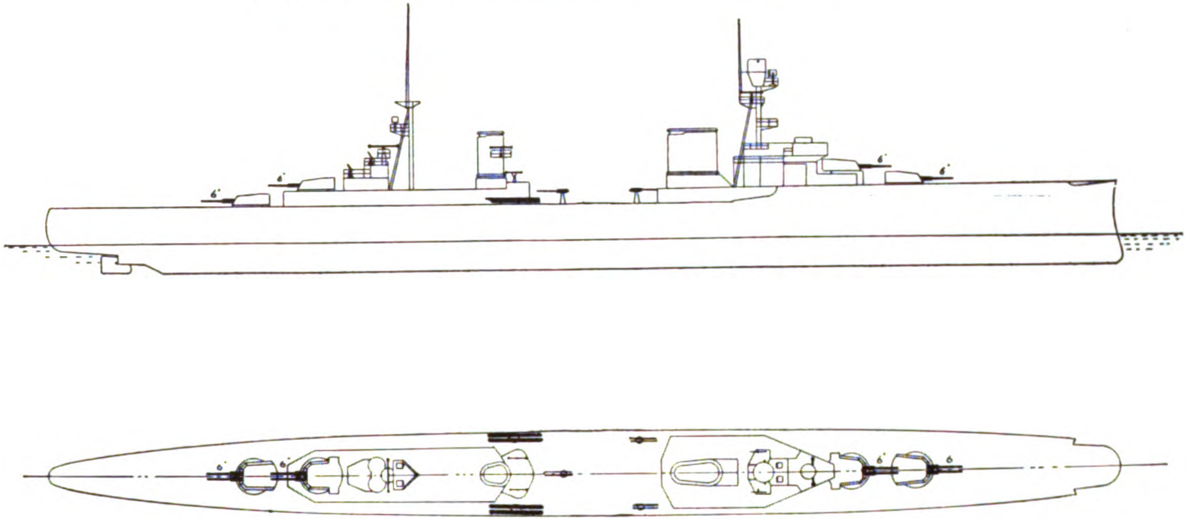
CRUISERS.

"Condottieri" Class.

Armando Diaz.*
Luigi Cadorna.*

Alberto di Guissano.
Alberico di Barbiano.

Bartolomeo Colleoni.
Giovanni della Bande Nere.



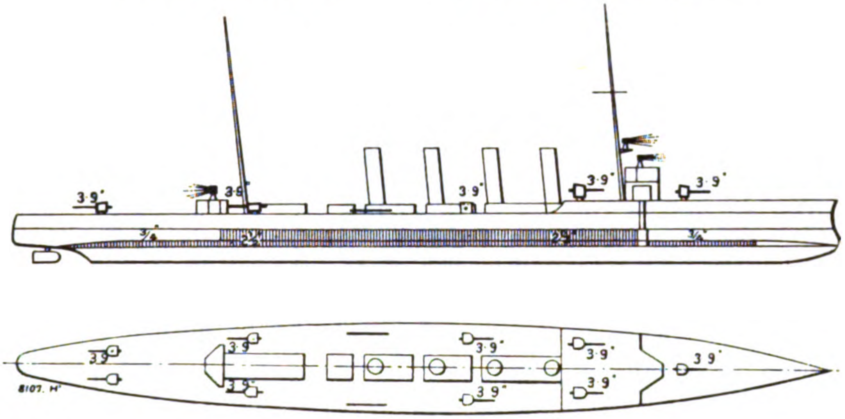
Length (extreme), 555 ft. 5 ins.; 5,069 tons (*554 ft. 6 ins., 5,008 tons); Speed, 37 knots; Completed, 1931–33.
Armament, 8—6-in.; 6—3·9-in. A.A.; 8—1·5-in. A.A.; 8 M.G.; 4 torpedo tubes;
1 catapult and 2 seaplanes.

Corrections to plan: The bridge and foremast have been modified. The after twin 3·9-in. A.A. gun is at the superstructure level on a raised platform.
* In the Armando Diaz and Luigi Cadorna the mainmast is forward of the after funnel, the torpedo tubes are abreast the forward funnel, and **the positions of the twin A.A. guns are reversed, the foremost gun being at forecastle deck level and the two after guns at upper deck level.**

ITALY.

LIGHT CRUISERS.*

Venezia (*ex-Austrian* **Saida**). **Brindisi** (*ex-Austrian* **Heligoland**).

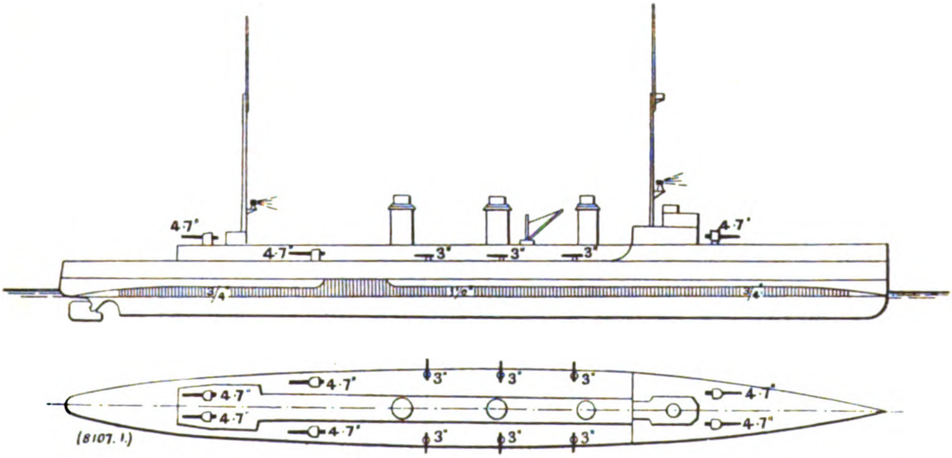


Length (extreme), 428 ft. 7 ins.; Length W.L., 413 ft. 5 ins.; Speed, 27 knots; 2,756 tons; Completed, 1914. Armament, 9—3·9-in.; 1—3-in. A.A.; 170 mines.

NOTE.—Thionville (*ex-Austrian* Novara), sister ship, allocated to France.

LIGHT CRUISER.*

Quarto.



Length (extreme), 431 ft. 9 ins.; Length B.P., 413 ft. 5 ins.; Speed, 28 knots; 2,903 tons; Completed, 1913. Armament, 6—4·7-in.; 4—3-in.; 2—2-pr. A.A.; 2 above-water 18-in. torpedo tubes; 126 mines.

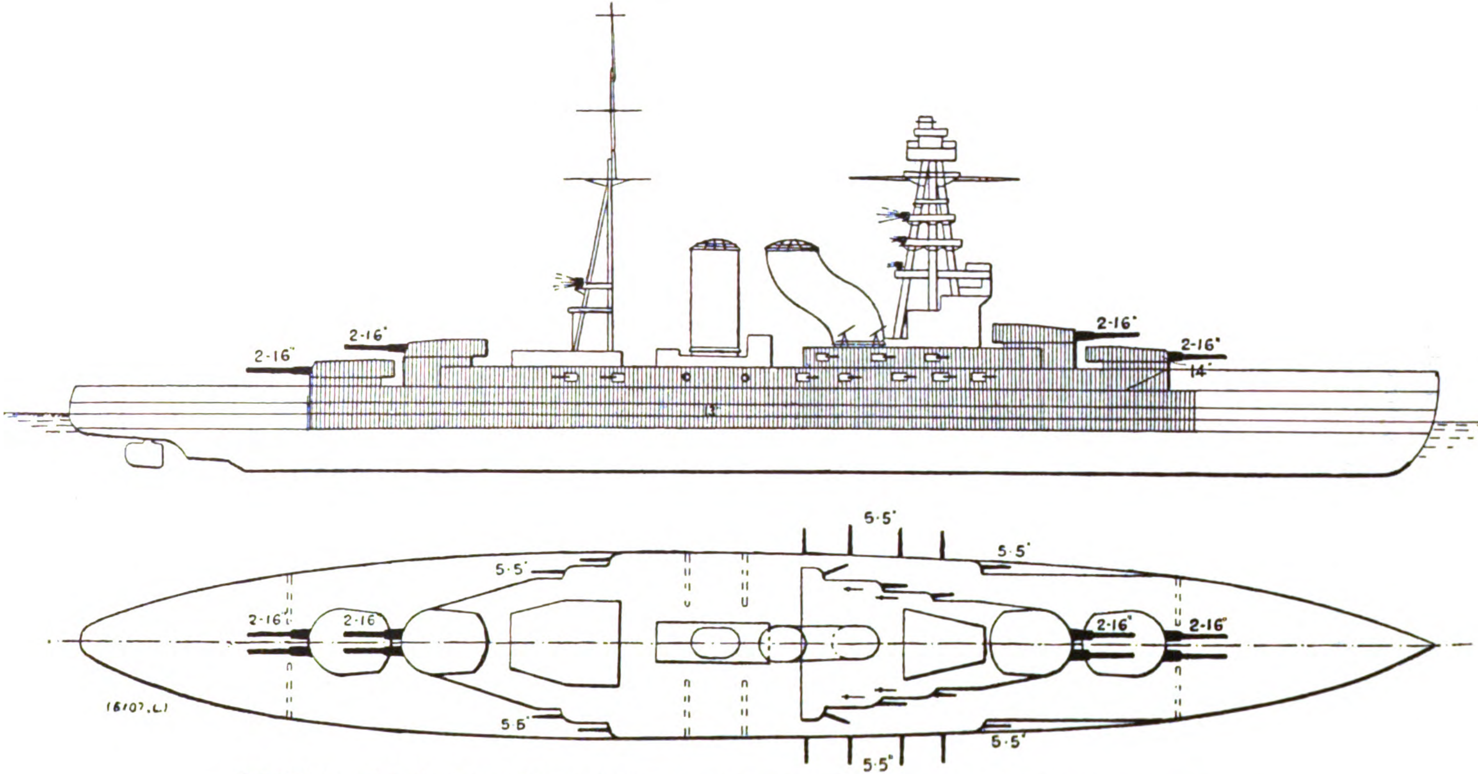
* Classified as Scouts in Italian official tests.

JAPAN.

BATTLESHIPS.

"Nagato" Class.

Nagato. **Mutsu.**



Length (extreme), 700 ft.; Length B.P., 660 ft. 7 ins.; Speed, 26 knots; 32,720 tons; Completed, 1920–1921. Reconstructed, 1936.
Armament, 8—16-in.; 20—5·5-in.; 8—5-in. A.A.; 1 catapult; 1 aircraft.

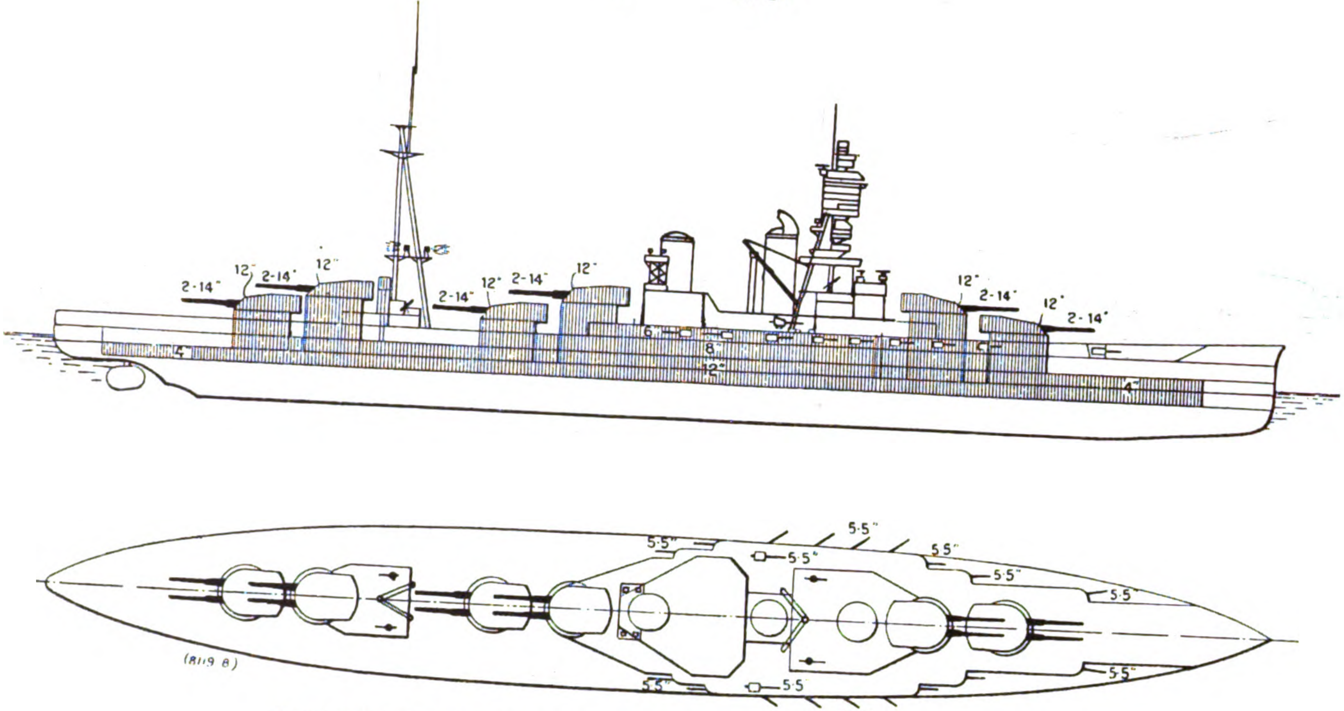
These ships were reconstructed 1935–36, a single funnel being fitted and a catapult added between mainmast and "X" turret.

JAPAN.

BATTLESHIPS.

"Fuso" Class.

Ise. **Hyuga.**



Length (extreme), 683 ft. ; Length B.P., 640 ft. ; Speed, 23 knots ; 29,990 tons ; Completed, 1917-18.
Armament, 12—14-in. ; 18—5·5-in. ; 8—5-in. A.A. ; 2 seaplanes.
Correction to Plan.—Fore topmast removed.

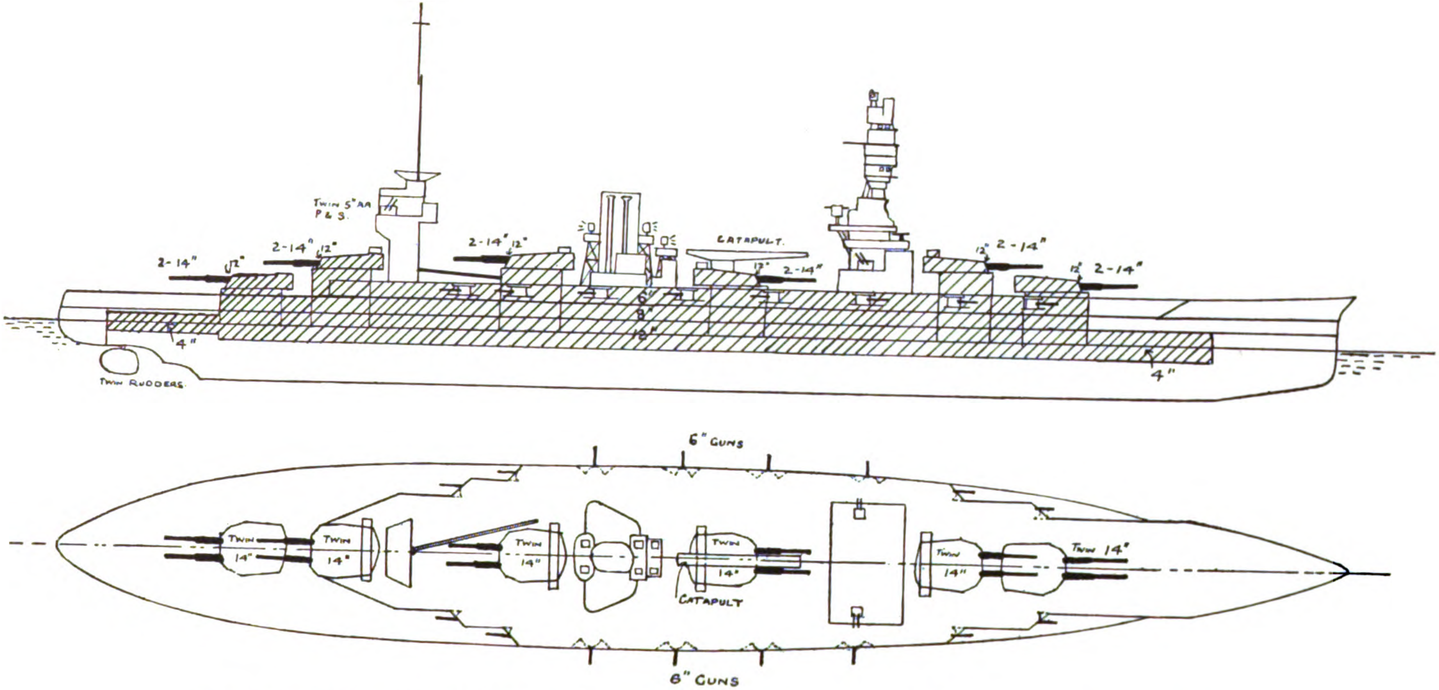
JAPAN.

BATTLESHIPS.

"Fuzo" Class.

Fuzo. **Yamashiro.**

(After reconstruction, 1934.)



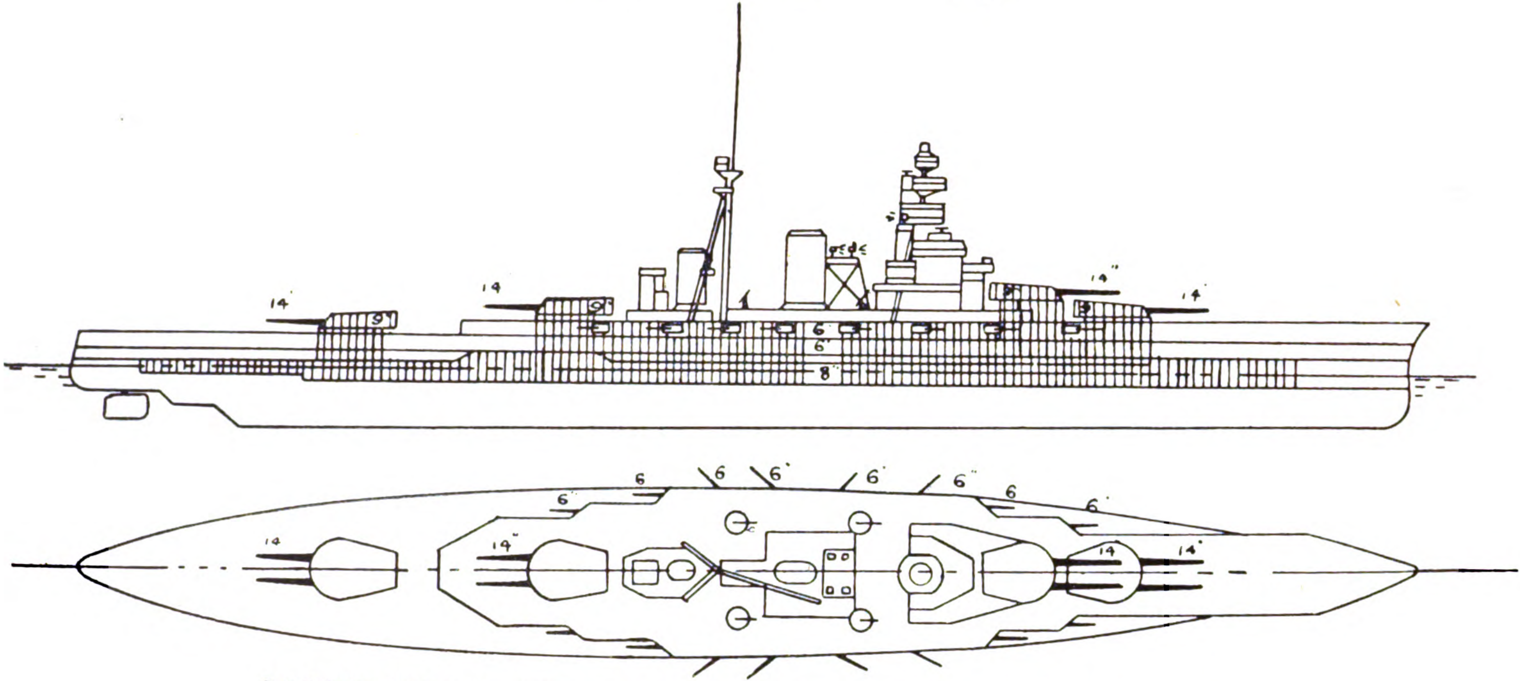
Length (extreme), 673 ft. ; Length B.P.. 630 ft. ; Speed, 22¼ knots ; 29,330 tons (standard) ; Completed, 1915. Reconstructed, 1933.
Armament, 12—14-in. ; 16—6-in. ; 8—5-in. A.A. ; 4 M.G. ; 4 L. ; 2 submerged 21-in. torpedo tubes ;
1 catapult ; 1 seaplane.

JAPAN.

BATTLESHIPS.

"Kongo" Class.

Haruna. **Kirishima.** **Kongo.**



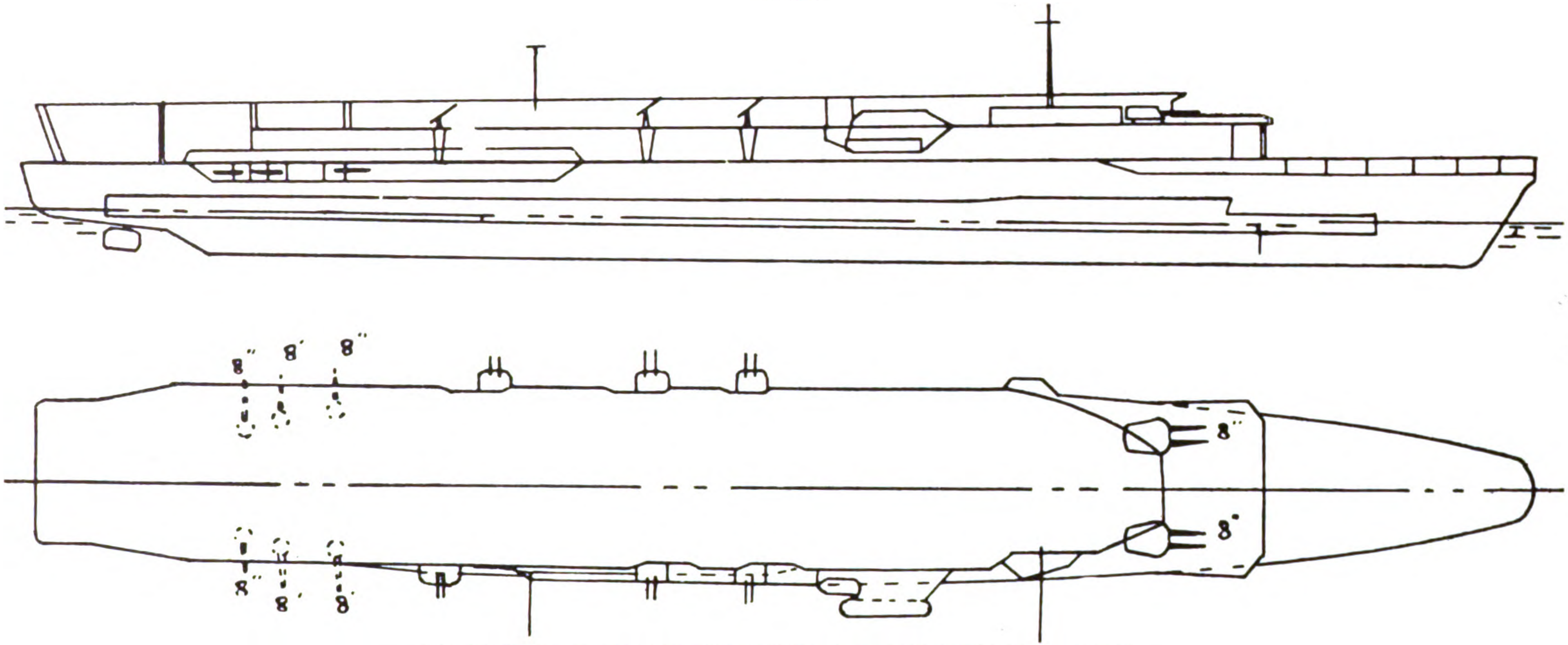
Length (extreme), 704 ft.; Speed, 26 knots; 29,330 tons; Completed, 1914-15; Modernised, 1928-31. Reconstructed, 1935—36.
Armament, 8—14-in.; 16—6-in.; 8—5-in. A.A.; 4 submerged 21-in. torpedo tubes; 3 aircraft.

Hiyei of this class has been converted to a Training Ship in accordance with the London Naval Treaty.

JAPAN

AIRCRAFT CARRIER.

Akagi.

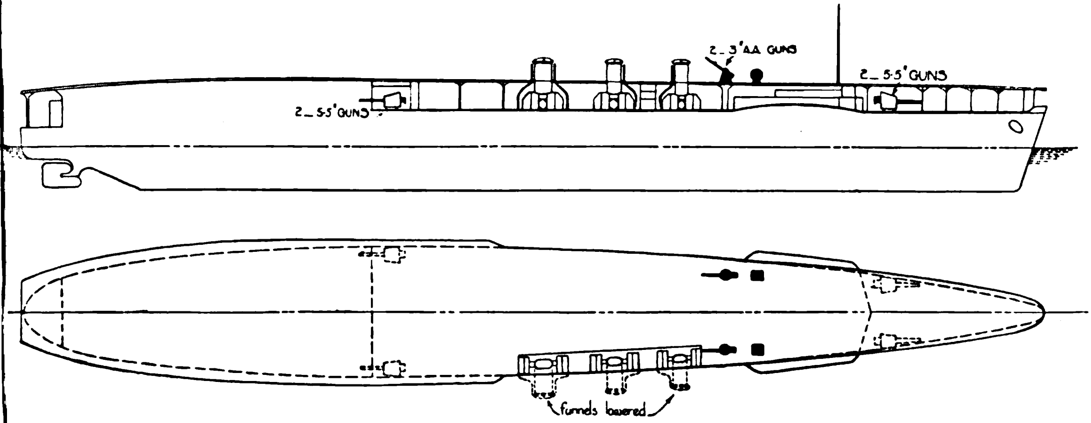


Length (between perpendiculars), 763 ft. ; 26,900 tons ; Speed, 28·5 knots ; Completed, 1927.
Armament, 10—8-in. ; 12—4·7-in. A.A. Accommodation for 50 planes.

JAPAN.

AIRCRAFT CARRIER.

Hosho

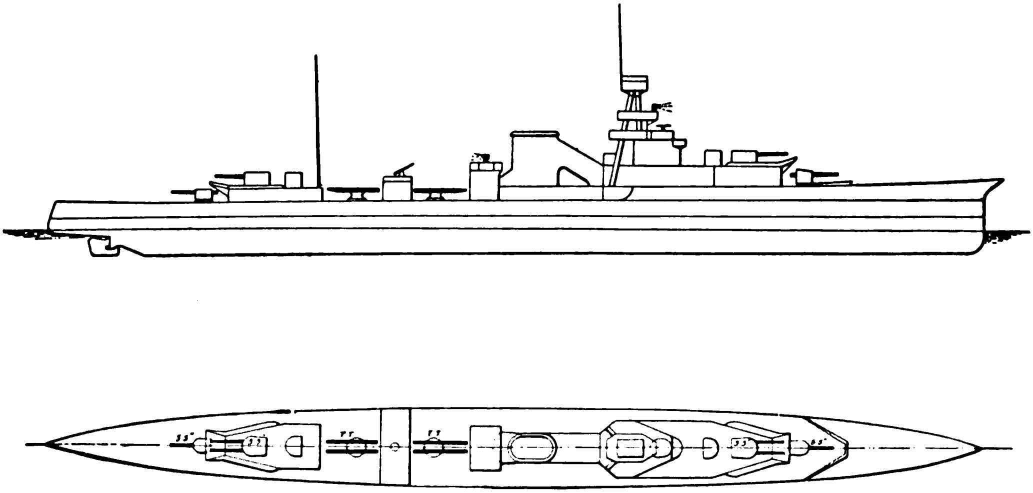


Displacement, 7,470 tons; Length B.P., 510 ft.; Speed, 25 knots; Completed, 1922.
Armament, 4—5·5-in.; 2—3-in. A.A.; Carries about 20 planes; Fitted with gyro-stabiliser.

JAPAN.

LIGHT CRUISER.

Yubari.



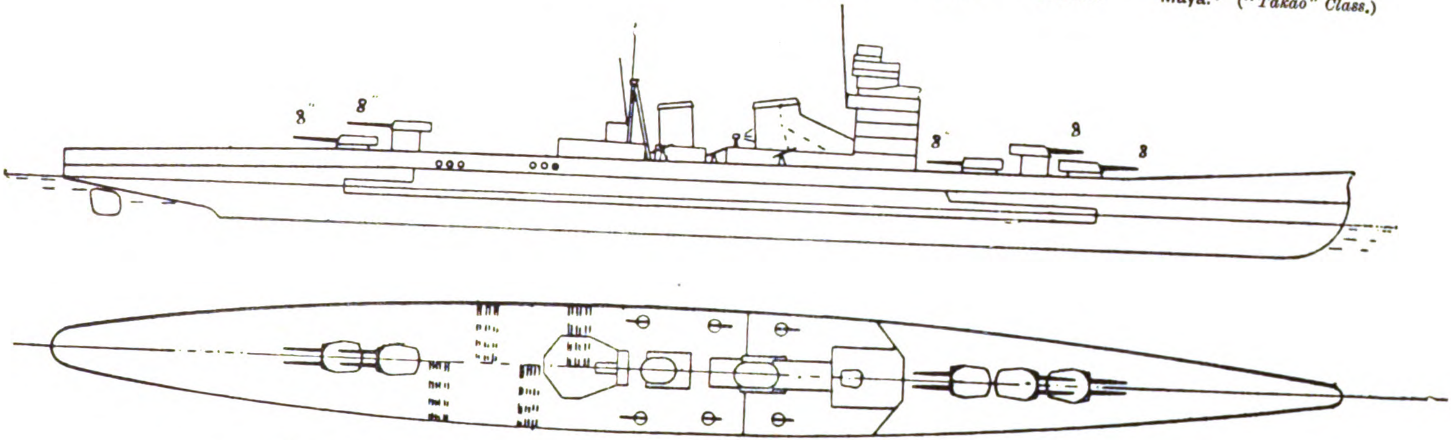
Length (extreme), 465 ft.; Length B P., 435 ft.; 2,890 tons; Speed, 33 knots. Completed, 1923.
Armament, 6—5·5-in.; 1—3 in. A.A.; 2 M.; 2 twin 21-in. torpedo tubes; 34 mines.
Correction to plan.—Masts raked aft.

JAPAN.

CRUISERS.

Nachi. **Myoko.** **Ashigara.** **Haguro.** (“*Nachi*” *Class.*)

Atago.* **Takao.*** **Chokai.*** **Maya.*** (“*Takao*” *Class.*)



Length (between perps.), 630 ft.; “Nachi” Class, 10,000 tons; “Takao” Class, 9,850 tons; Speed, 33 knots. Armament, 10—8-in.; 8—4·7-in. A.A.; 12—21-in. torpedo tubes; 2 catapults; 4 aircraft.

* These have 4—4·7-in. A.A., and 8–21-in. torpedo tubes.

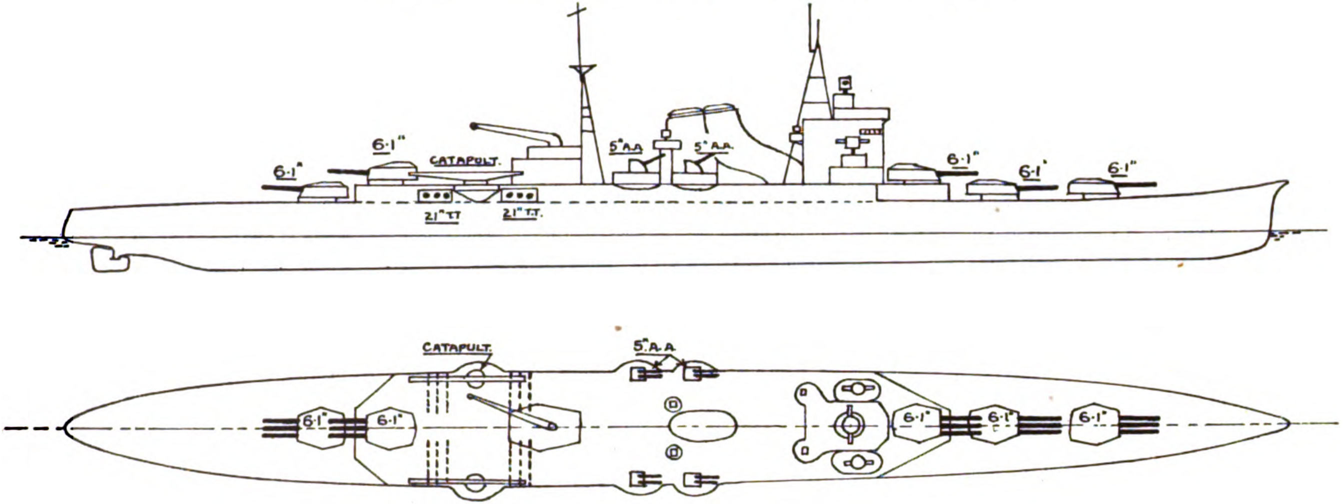
Corrections to plan.—In the “Takao” class the after funnel is vertical, and the torpedo tubes are beneath the funnels on a deck higher. The four 4·7-in. A.A. guns are also a deck higher. In the “Nachi” class the foremost pair of 4·7-in. A.A. guns are a deck higher. Catapults fitted abaft mainmast.

JAPAN.

CRUISERS.

"Mogami" Class.

Mogami. **Mikuma.** **Suzuya.** **Kumano.** **Tone.**



Length (extreme), 640 ft. ; 8,500 tons ; Speed, 33 knots.

Armament, 15—6·1 in. ; 8—5-in. A.A. ; 12—21-in. torpedo tubes ; 2 catapults, 4 aircraft.

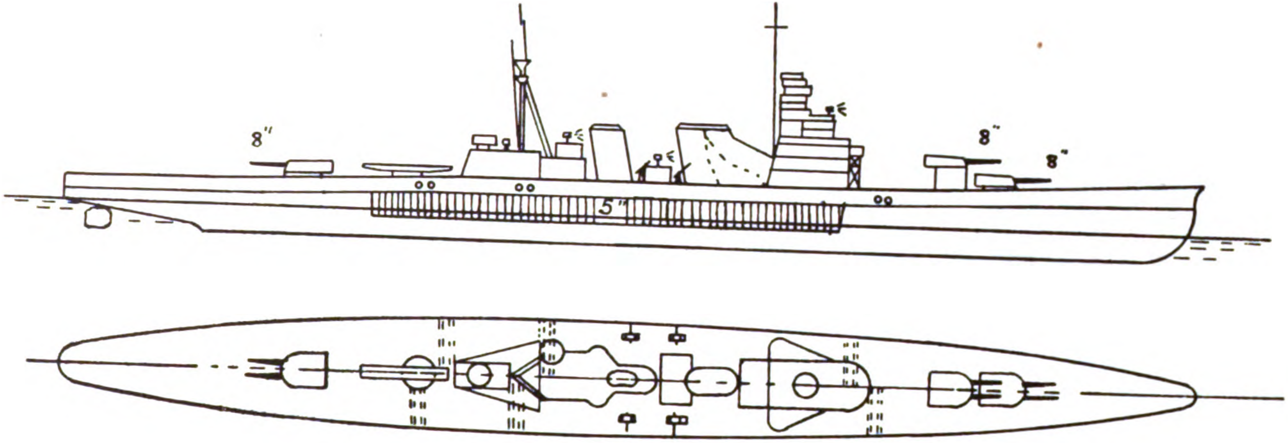
Mogami and Mikuma completed, 1935 ; Suzuya, 1936 ; Kumano and Tone still under construction.

JAPAN.

CRUISERS.

"*Furutaka*" *Class.*

Aoba. **Kinugasa.**



Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots. Completed, 1927.
Armament, 6—8-in. ; 4—4·7-in. A.A. ; 12—21-in. torpedo tubes ;
1 catapult ; 2 aircraft.

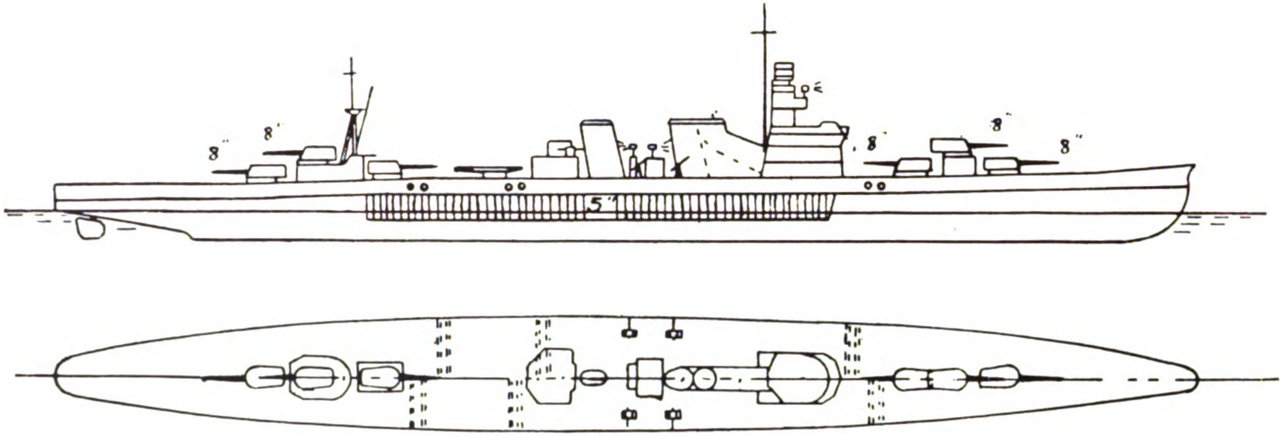
Correction to plan.—The tops of the funnels are square to the funnels.

JAPAN.

CRUISERS.

"*Furutaka*" *Class.*

Furutaka. **Kako.**



Length (extreme), 595 ft.; 7,100 tons; Speed, 33 knots.
Armament, 6—8-in.; 4—4·7-in. A.A.; 12 above-water 21-in. torpedo tubes;
1 catapult; 2 aircraft.

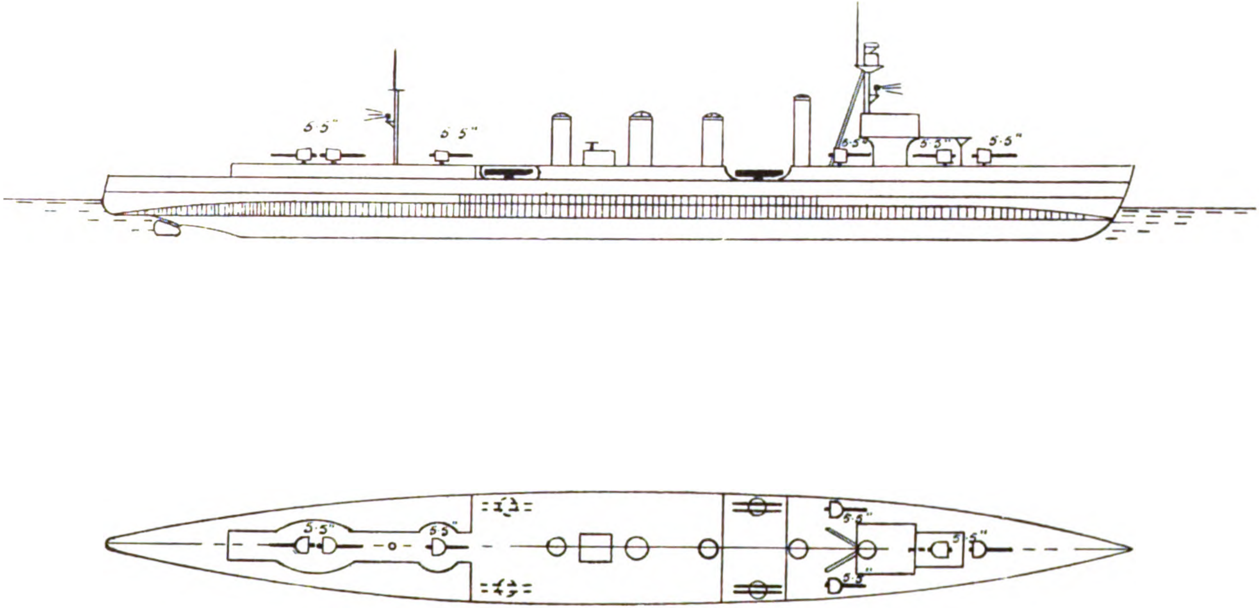
Correction to plan.—The tops of the funnels are square to the funnels.

JAPAN.

LIGHT CRUISERS.

"Sendai" Class.

Naka. **Sendai.** **Jintsu.**



Length (extreme), 535 ft.; Speed, 33 knots; 5,195 tons; Completed, 1924–25.

Armament, 7—5·5-in.; 2—3-in. A.A.; 4 twin 21-in. torpedo tubes;
1 seaplane; 1 catapult.

Correction to plan.—Bows of Jintsu and Naka have been modified to give more flair.
Catapult fitted abaft mainmast.

JAPAN.

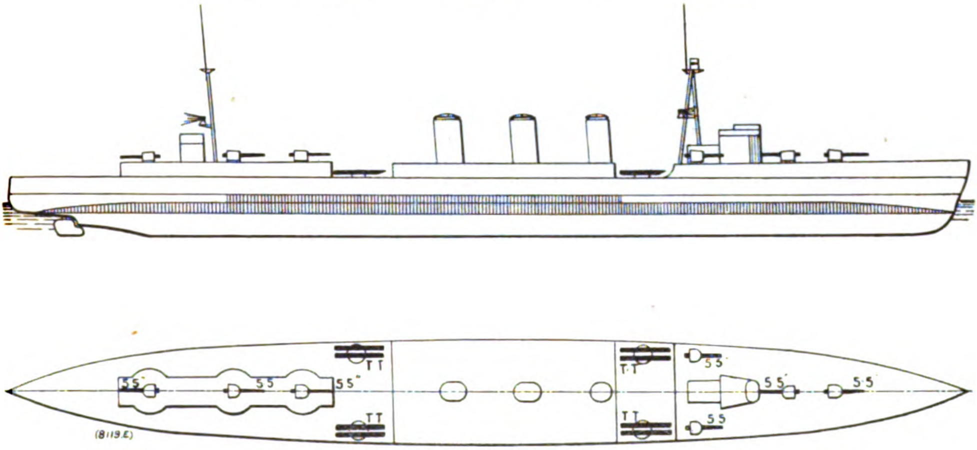
LIGHT CRUISERS.

"Natori" Class.

* { **Isudzu.** **Nagara.**   * { **Natori.** **Yura.**   * { **Kinu.** **Abukuma.**

"Kuma" Class.

Oi.   **Kiso.**   **Kitakami.**   **Tama.**   **Kuma.**



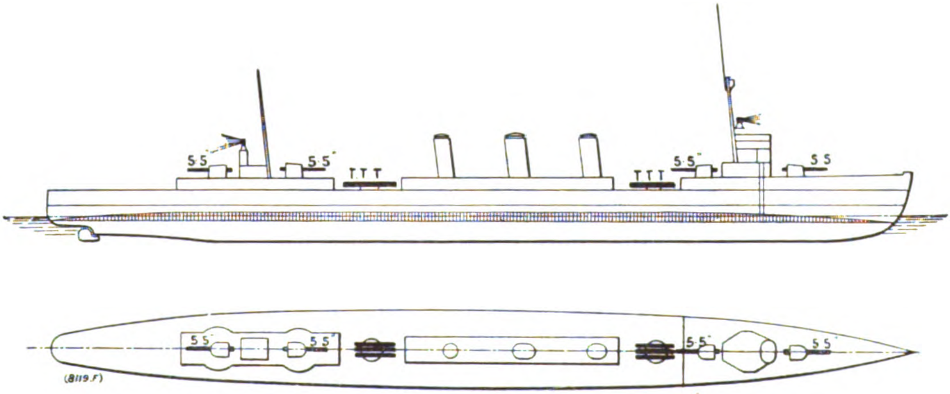
Length (extreme), 535 ft. ; Length B.P., 500 ft. ; Speed, 33 knots ; 5,100 tons ; Completed, 1920–21.
Armament, 7—5·5-in. ; 2—3-in. A.A. ; 2 M. ; 4 twin above-water 21-in. torpedo tubes ; 1 catapult ; 1 aircraft.

* Plans apply generally to these vessels except that aircraft hangar is arranged in bridge structure.
The displacement is 70 tons higher than Oi, etc. These vessels were completed, 1922–23.
Catapult fitted before mainmast.

LIGHT CRUISERS.

"Tenryu" Class.

Tatsuta.   **Tenryu.**

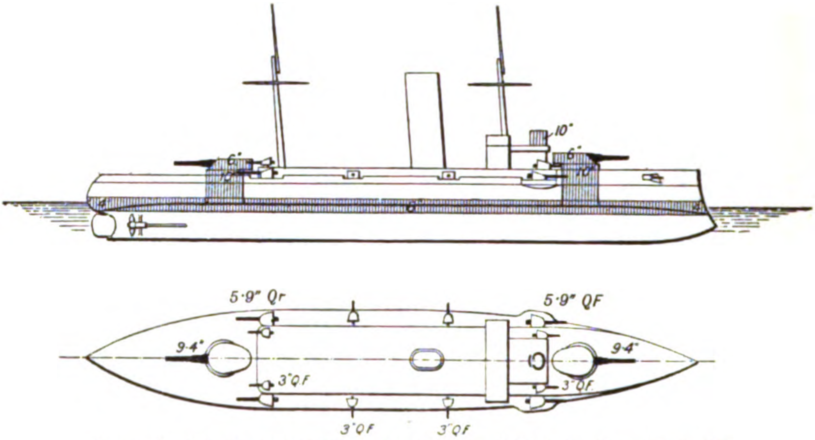


Length (extreme), 468 ft. ; Speed, 31 knots ; 3,230 tons ; Completed, 1919.
Armament, 4—5·5-in. ; 1—3-in. A.A. ; 2 M.; 2 triple above-water torpedo tubes.
Fitted for Minelaying.

NETHERLANDS.

COAST DEFENCE SHIP.

Hertog Hendrik

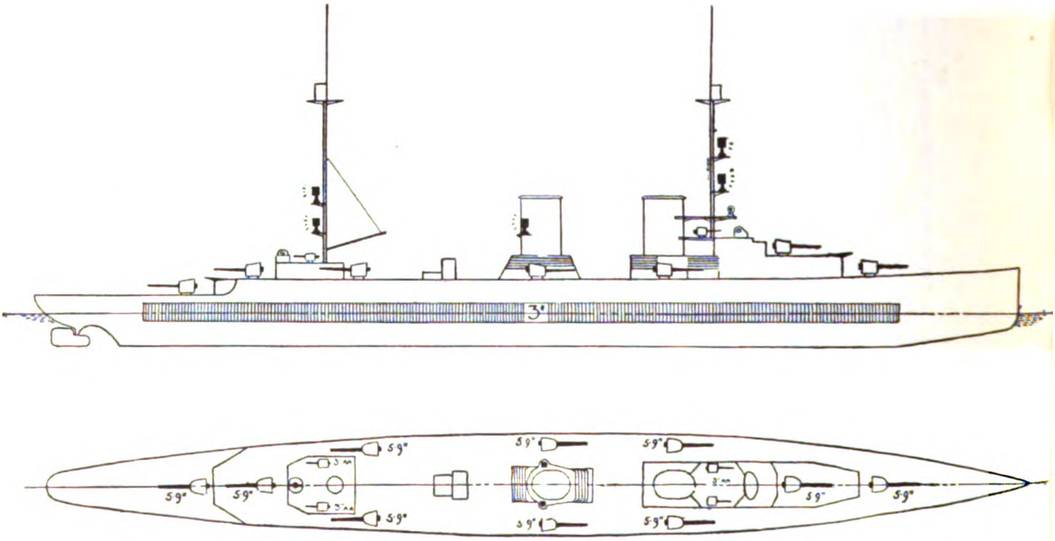


Hertog Hendrik: Length, 317 ft.; 4,371 tons; Speed, 16 knots; Completed, 1903.
1—9·4-in.; 4—5·9-in.; 4—3-in.; 7 small.
After gun removed.

NETHERLANDS.

CRUISERS.

Java. Sumatra.



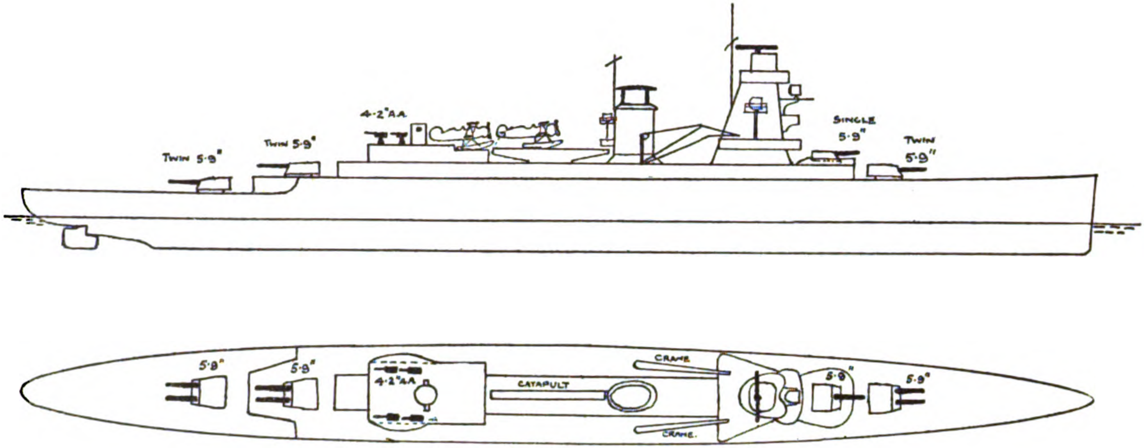
Length, 509½ ft.; 6,670 tons; Speed, 31 knots; Completed, 1925–26.
Armament, 10—5·9 in.; 8 M.
40 mines; 2 seaplanes.

Correction to plan.—These cruisers have been reconditioned. The 4—3-in. A.A. have been removed. The mainmast has been shortened and moved forward. 3—4-cm. machine guns have been fitted each side of the after deck house. The forward 4-sided 5·9-in. have been raised a deck to the signal deck, which has been extended aft for the purpose. Fore topmast shortened and foremast made larger.

NETHERLANDS.

CRUISER.

De Ruyter.



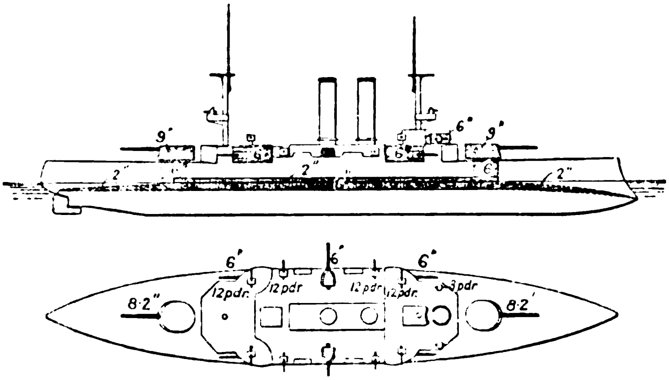
Length (extreme), 560 ft.; 6,100 tons; Speed, 32 knots.
Armament, 7—5·9-in.; 10—1·5-in. A.A.; 8 M.G.; 1 catapult; 2 seaplanes.

Completed, 1936.

NORWAY.

COAST DEFENCE SHIPS.

Norge. **Eidsvold**

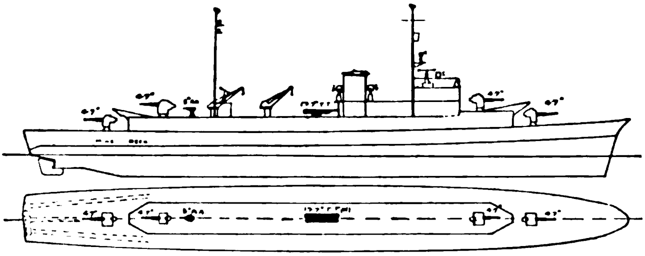


Length, 310 ft. ; 4,166 tons ; Speed, 16·5 knots ; Completed, 1901.
Armament, 2—8·2-in. ; 6—6-in. ; 8—3-in. ; 2—3-pr. ; 2 submerged 18-in. torpedo tubes.

NORWAY.

MINELAYER AND TRAINING SHIP.

Olav Trygvason.

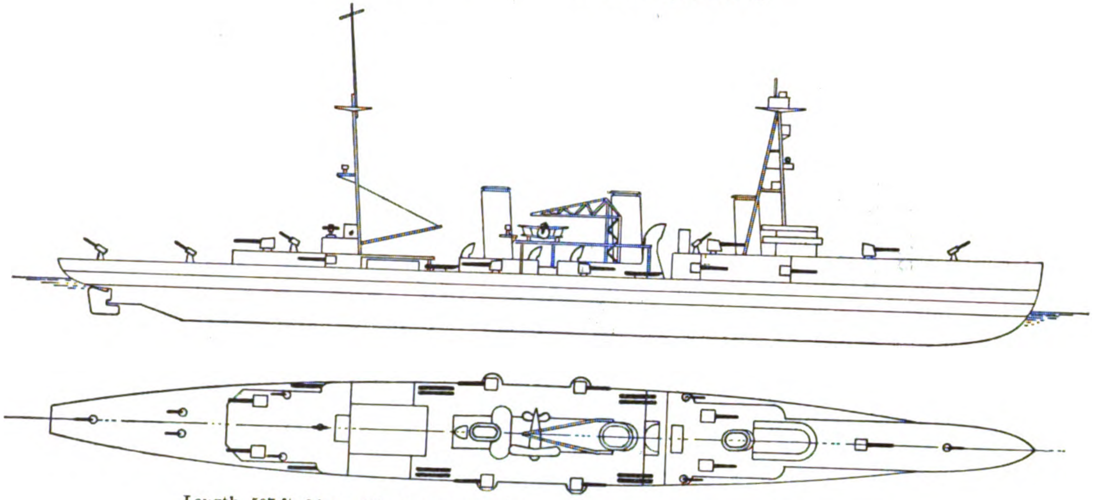


Length, 319¼ ft. ; 1,747 tons ; speed, 21½ knots ; Completed, 1934.
Armament, 4—4·7-in. ; 1—3-in. A.A. ; 2—17·7-in. torpedo tubes.
280 mines.

SOVIET UNION.

CRUISERS.

Profintern. **Chervonnaya Ukraina**

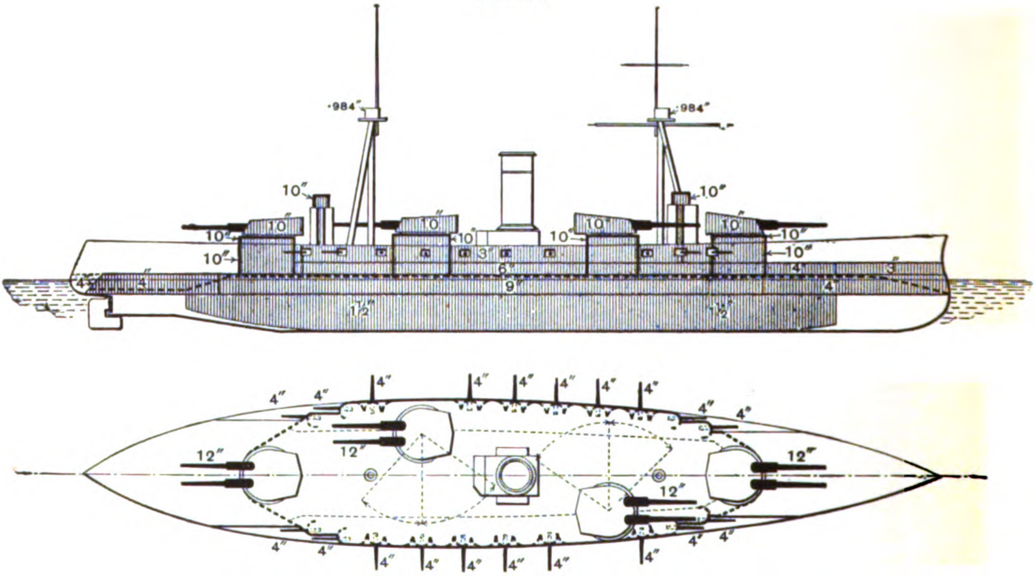


Length, 507 ft. 9 ins.; Displacement, 7,600 tons; Speed, 29½ knots; Completed, 1924–25.
Armament, 15—5·1-in.; 8—3-in. A.A.; 8—torpedo tubes; 100 mines; 1 seaplane.

SPAIN

BATTLESHIP.

Jaime I.

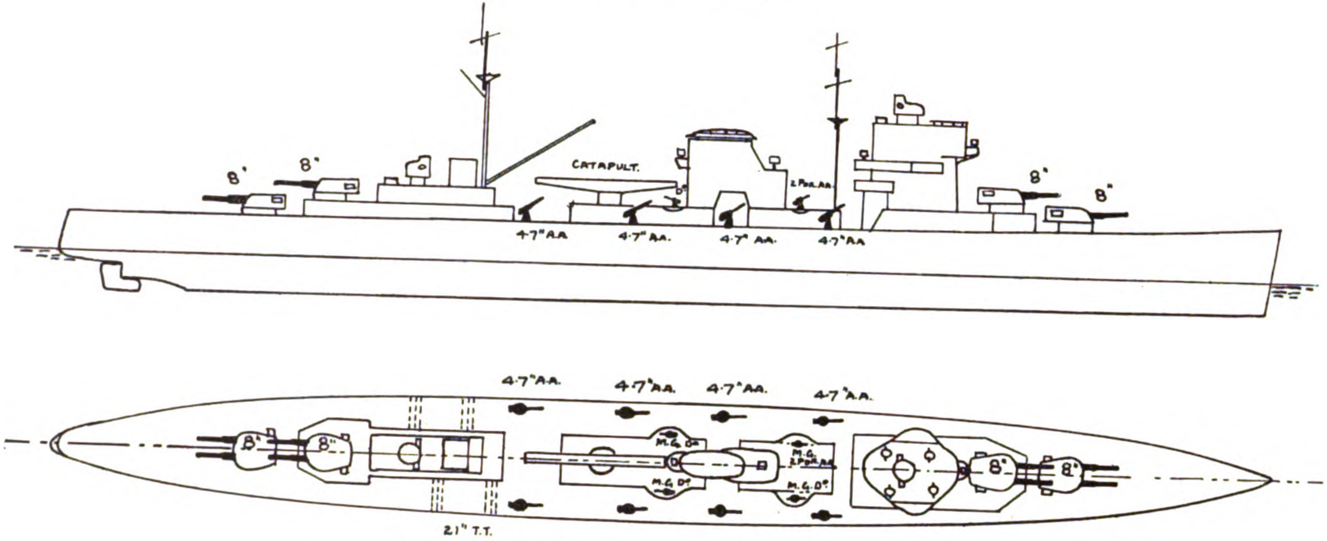


Length (extreme), 459 ft. ; Length W.L., 435 ft. ; 14,224 tons ; Speed, 19·5 knots ; Completed, 1921.
Armament, 8—12-in. ; 20—4-in. ; 4—3-pr. ; 2 M. ; 2—3-in. A.A. ; 2 L.
Fore topmast and yards removed from Jaime I.

SPAIN.

CRUISERS.

Baleares. **Canarias.**

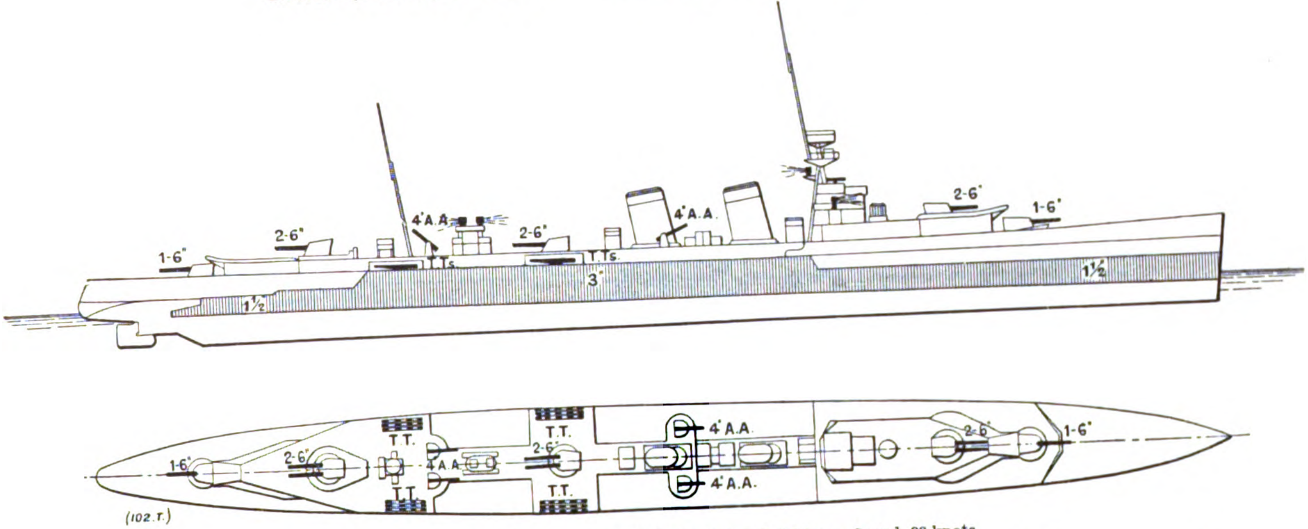


Length (extreme), 636 ft. ; 10,000 tons ; 33 knots ; Completed, 1935.
Armament, 8—8-in. ; 8—4·7-in. A.A. ; 8—2-pdr. A.A. ; 12—21-in. torpedo tubes ; 1 catapult ; 2 aircraft.
Main topmast removed.

SPAIN.

CRUISERS.

Libertad (*ex*-**Principe Alfonso**). **Almirante Cervera.** **Miguel de Cervantes.**



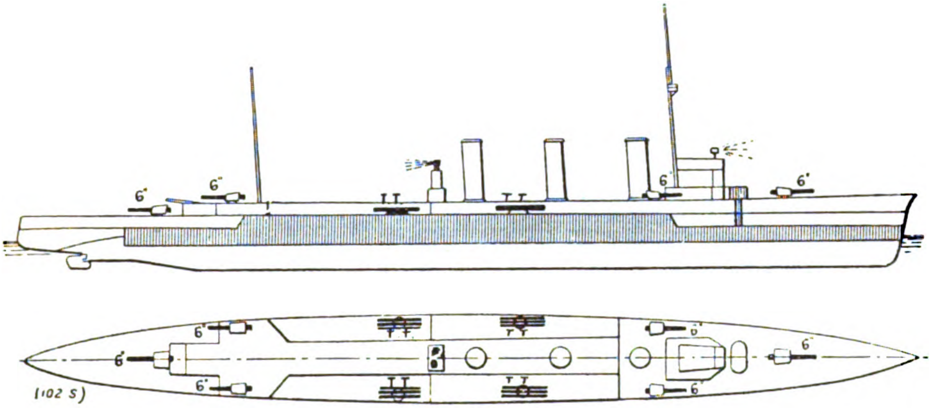
Length (extreme), 579 ft. 6 ins.; Length B.P., 545 ft.; 7,475 tons; Speed, 33 knots.
Armament, 8—6-in.; 4—4-in. A.A.; 2—3 pr.; 4 triple above-water torpedo tubes (21-in. torpedoes).

Corrections to plan.—The mainmast is tripod. There is no fore topmast.

SPAIN.

LIGHT CRUISER.

Mendez Nuñez.



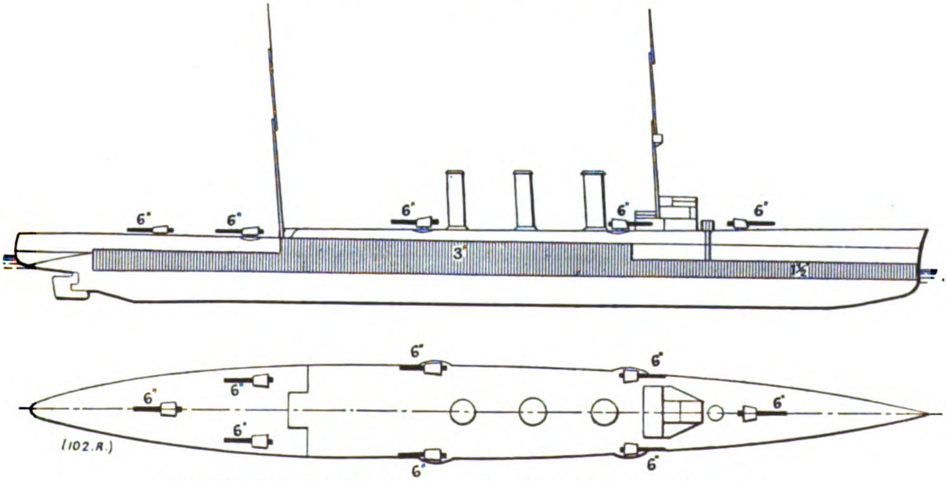
Length (extreme), 462 ft. ; Length B.P., 439 ft. ; 4,509 tons ; Speed, 29 knots. Completed, 1924.
Armament, 6—6-in. ; 4—3-pr. A.A. ; 4 M. ; 4 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to 1½ ins. at the ends.

Correction to plan.—The foremast is tripod. Fore topgallant mast is fitted.

LIGHT CRUISER.

Republica (*ex*-Reina Victoria Eugenia).



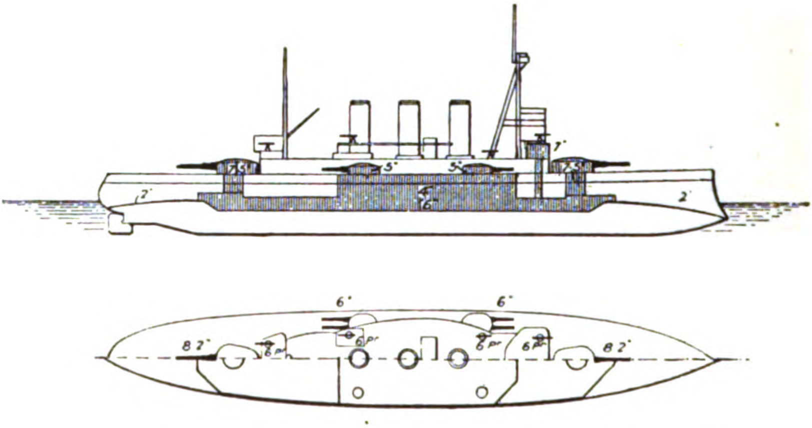
Length (extreme), 462 ft. ; 4,857 tons ; Speed, 25½ knots ; Completed, 1923.
Armament, 9 *—6-in. ; 4—3-pr. A.A. ; 4 M. ; 1 L. ; 4—21-in. torpedo tubes.

* Correction to plan.—There should be two 6-in. guns abreast forward instead of one on the centre line as shown.

SWEDEN.

BATTLESHIP.

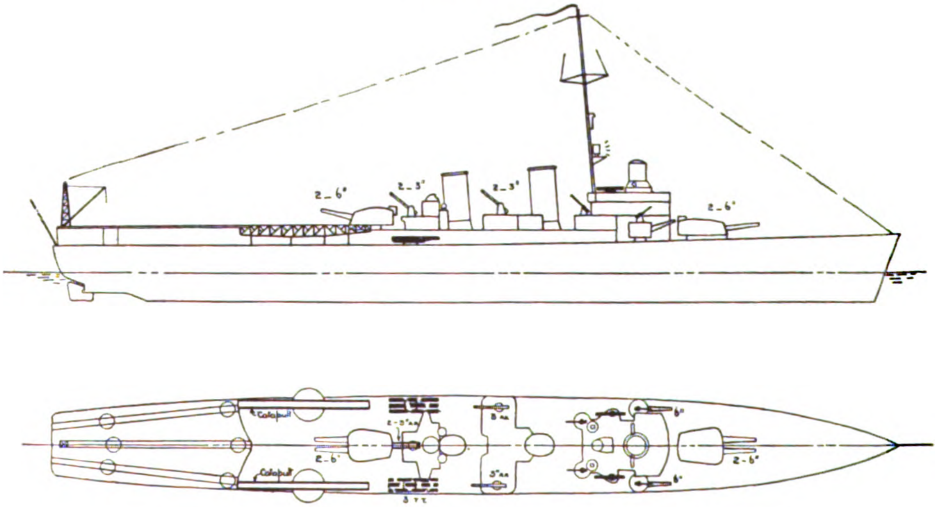
Oscar II.



Length, 313·6 ft. ; 4,085 tons ; Speed, 18 knots ; Completed, 1907.
Armament, 2—8·3-in. ; 8—6-in. ; 8—6-pr. ; 1—1-pr. ; 2 submerged 18-in. torpedo tubes.

AIRCRAFT CRUISER.

Gotland.

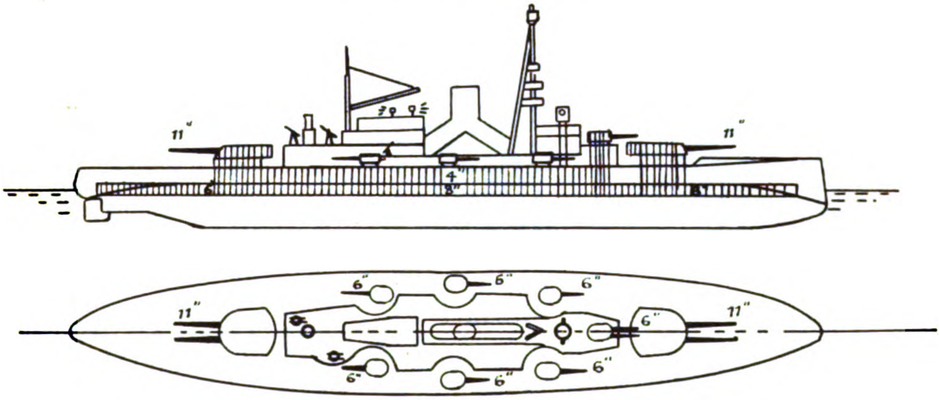


Length, 442 ft. ; 4,527 tons ; 33,000 H.P. ; Speed, 27 knots ; Completed, 1934.
Armament, 6–6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes ; 1 catapult ; 6 aircraft.
Correction to plan.—1 catapult is fitted on middle line.

SWEDEN.

COAST DEFENCE SHIPS.

Gustav V. **Sverige.**
(As reconstructed 1924–29.)



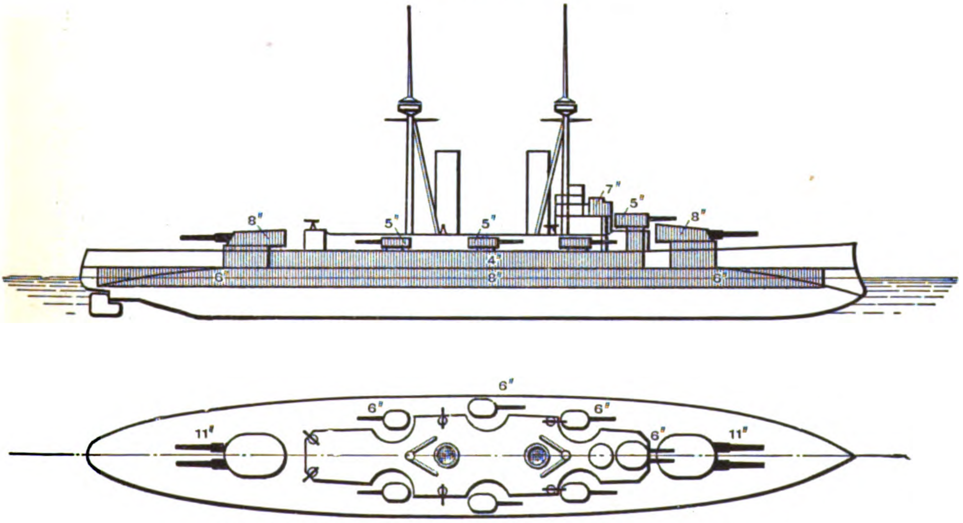
Length, 396·7 ft. ; 6,899 tons ; Speed, 23 knots ; Completed, 1917–1921.
Armament, 4—11-in. ; 8—6-in. ; 4—3-in. ; 2—6-pr. ; 2 M.

Correction to plan.—Fore topmast added. In Sverige the mainmast is shortened ; two funnels are fitted, the after one being vertical and the forward one bent.

SWEDEN.

COAST DEFENCE SHIP.

Drottning Victoria.



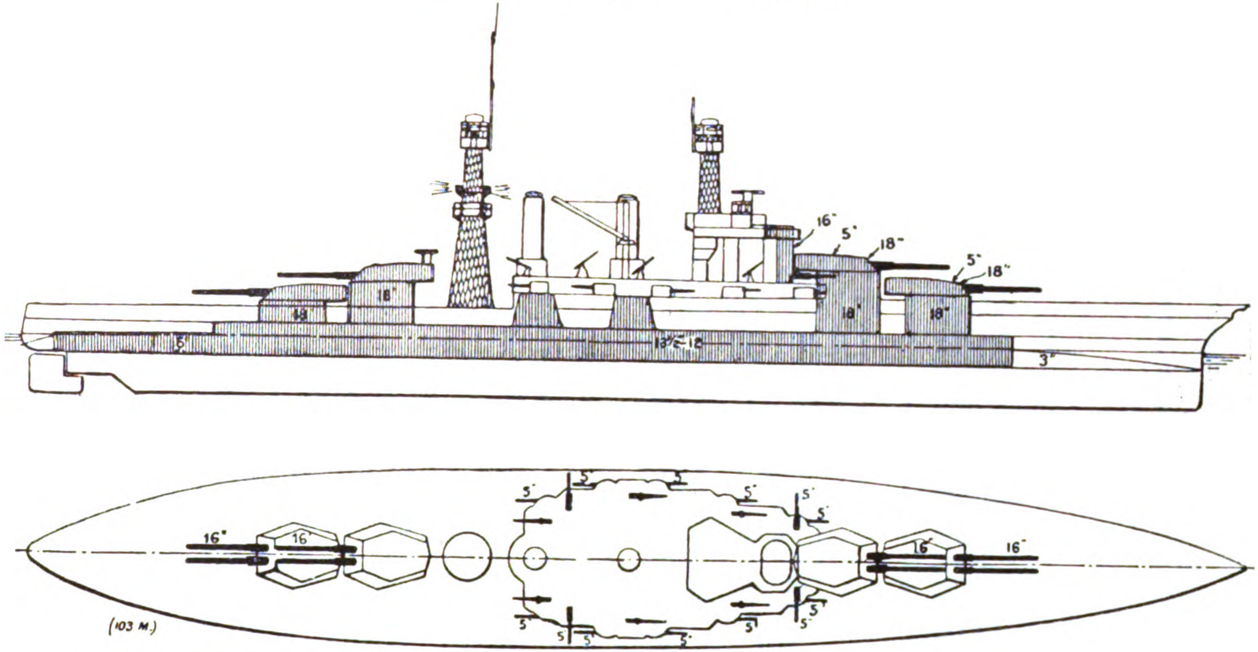
Length, 396·7 ft.; 6,899 tons; Speed, 23 knots; Completed, 1921.
Armament, 4—11-in.; 8—6-in.; 4—3-in.; 2—6-pr.; 2 M.

Mainmast removed and bridgework modified.

UNITED STATES

BATTLESHIPS.

Colorado. **Maryland.** **West Virginia.**



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 32,600 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.

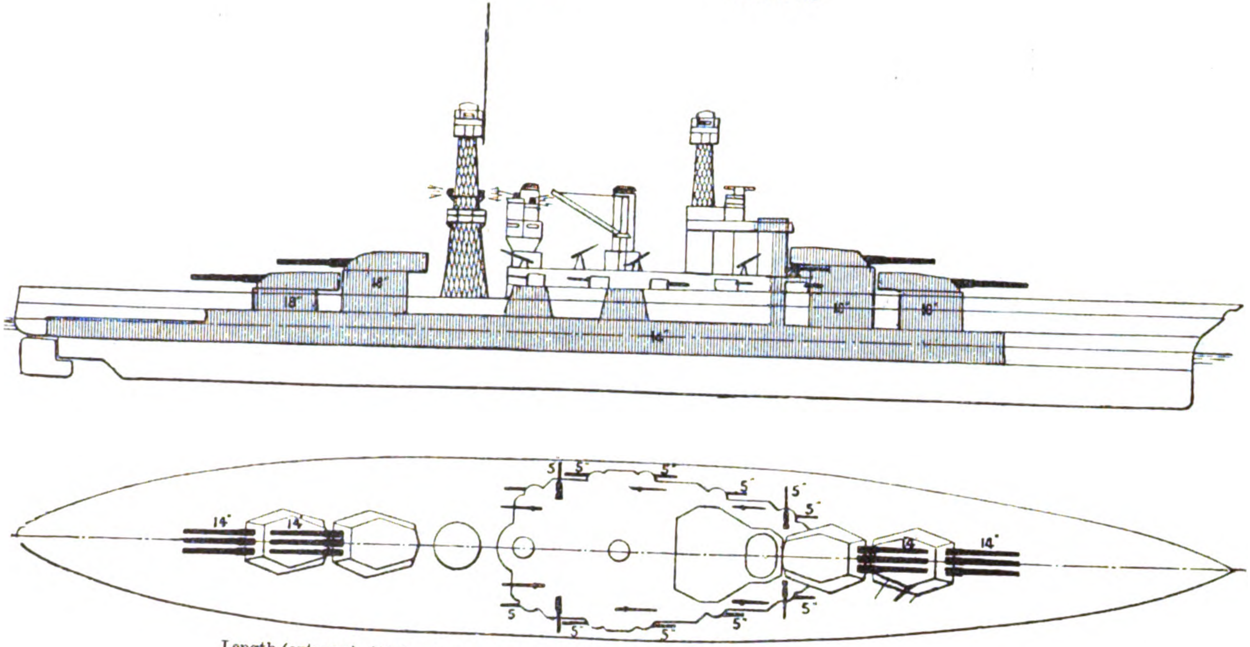
Armament 8—16-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. ; 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 aircraft.

Correction to plan.—Catapults fitted on "X" turret and quarter deck. Crane fitted at stern. **Main topmast shortened.**

UNITED STATES.

BATTLESHIPS.

California. **Tennessee.**



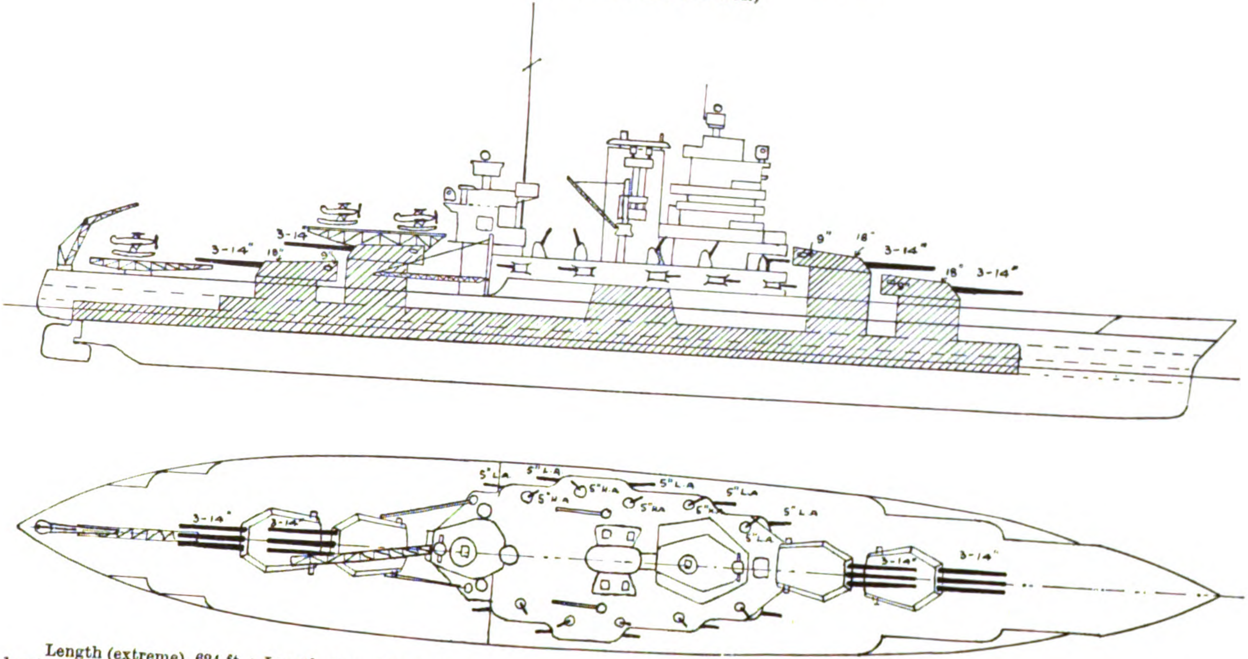
Length (extreme), 624 ft.; Length W.L., 600 ft.; Speed, 21 knots; 32,300 tons; Completed, 1920-21.
Armament, 12—14-in.; 12—5-in.; 8—5-in. A.A.; 4—6-pr.; 2—1-pr.; 2 submerged 21-in. torpedo tubes.
2 catapults (one right aft on Quarter Deck and one "X" turret); 3 seaplanes.
Main topmast shortened. Crane at stern.

UNITED STATES.

BATTLESHIPS.

Idaho. **New Mexico.** **Mississippi.**

(After modernisation 1934.)



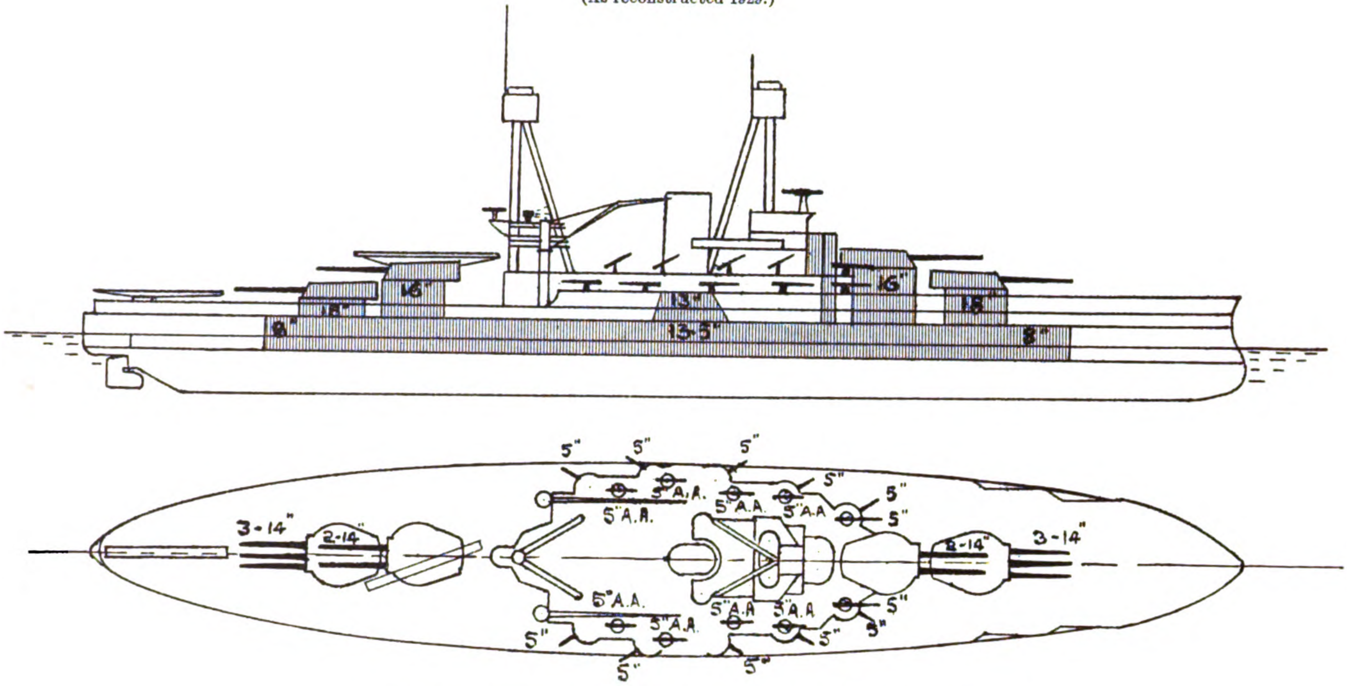
Length (extreme), 624 ft. ; Length, W.L., 600 ft. ; Speed, 22½ knots ; 33,000 tons ; Idaho and New Mexico, 33,400 tons ; Completed, 1917–1919 ; Modernised, 1931–1934. Armament, 12–14 in. ; 12–5-in. ; 8–5-in. A.A. ; 4–6 pr. (Idaho, 4–3 pr.) ; 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 seaplanes.

UNITED STATES.

BATTLESHIPS.

Nevada. **Oklahoma.**

(As reconstructed 1929.)



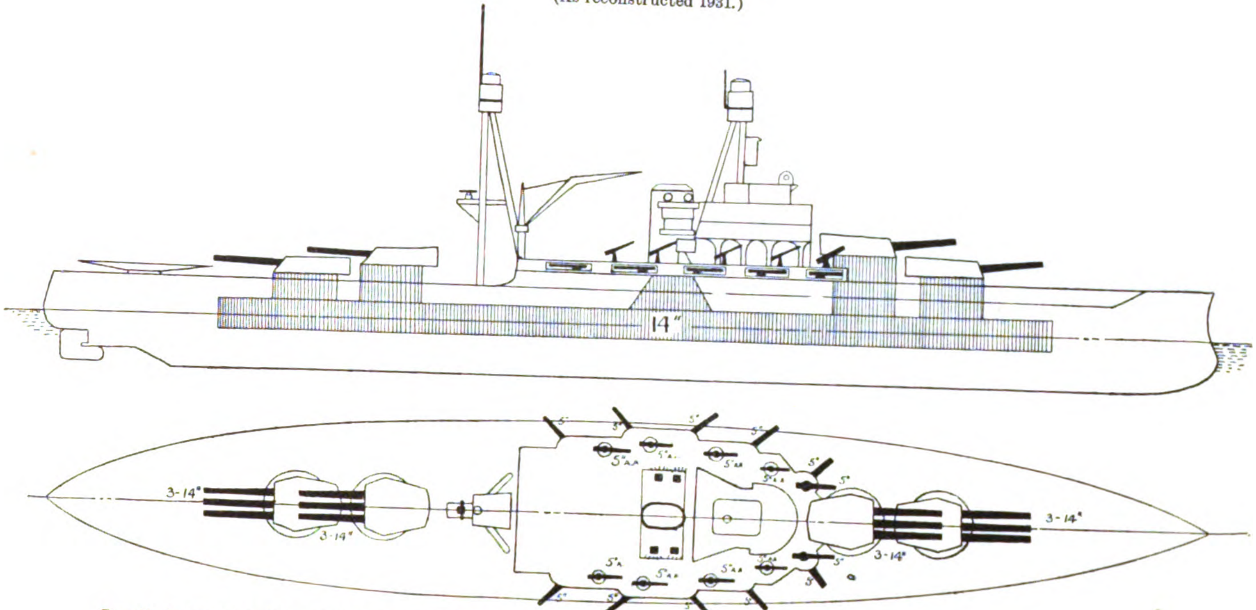
Length (extreme), 583 ft. ; Length W.L., 575 ft. ; Speed, 20·5 knots ; 29,000 tons.
Armament, 10—14-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. (Oklahoma, 4—3-pr.) ; 2—1-pr. ; 2 M. ; 2 L. ; 2 catapults ; 3 aeroplanes.

UNITED STATES.

BATTLESHIPS.

Arizona. **Pennsylvania.**

(As reconstructed 1931.)



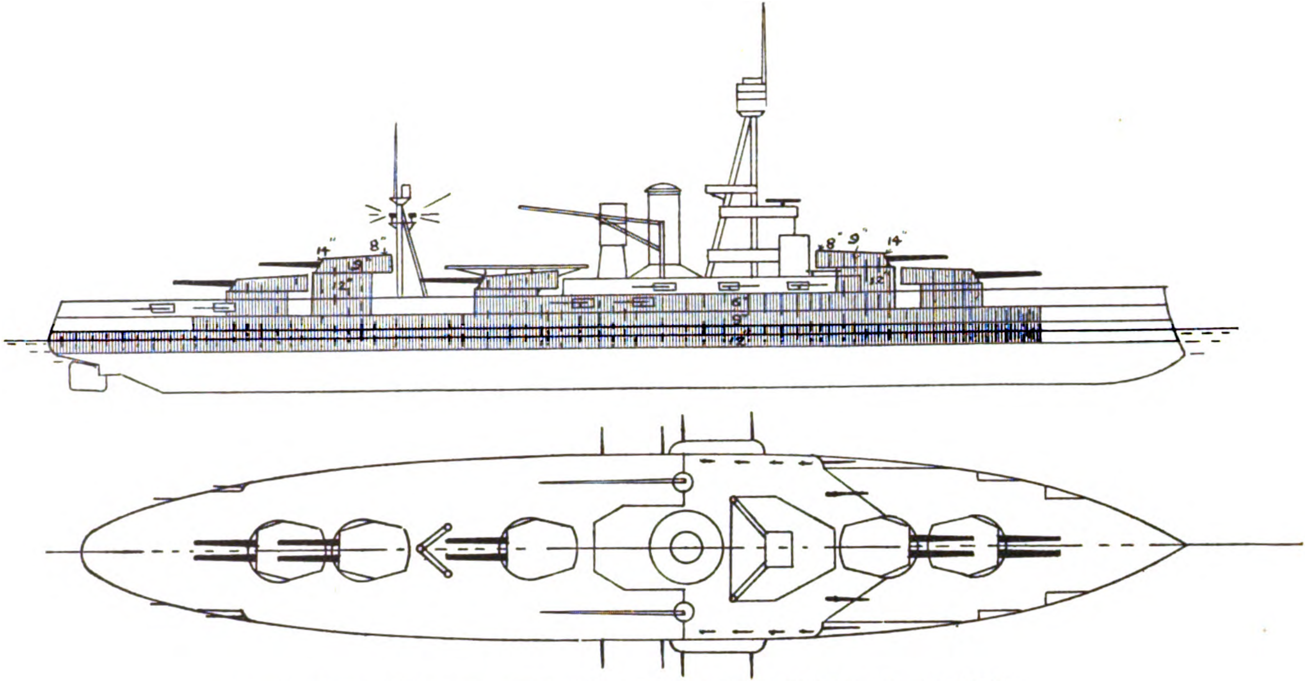
Length (extreme), 608 ft.; Length B.P., 596 ft.; Speed, 21 knots; Pennsylvania 33,100 tons; Arizona 32,600 tons; Completed, 1916.
Armament, 12—14-in.; 12—5-in.; 8—5-in. A.A.; 4—3-pr.; 2—1-pr.; 2 M.; 2 L.; 2 catapults; 3 aircraft.
Correction to plan.—Catapults fitted on "X" turret and quarter deck. Crane fitted at stern. Main topmast is on fore side of mast structure.

UNITED STATES.

BATTLESHIPS.

New York. **Texas.**

(As reconstructed 1927.)



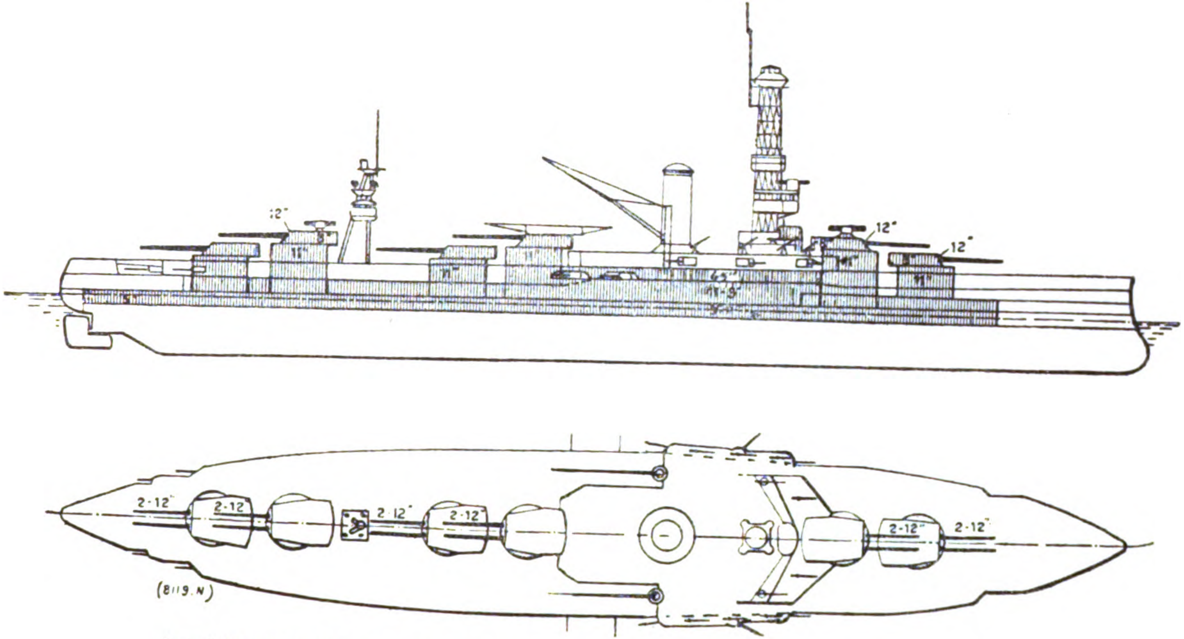
Length (extreme), 573 ft. ; Length W.L., 566 ft. ; Speed, 21 knots ; 27,000 tons ; Completed, 1914.
Armament, 10—14-in. ; 16—5-in. ; 8—3-in. A.A. : 4—3-pr. ; 2—1-pr. ; 8 M. ; 1 catapult ; 3 aircraft.
Fore topmast removed and mast head modified.

UNITED STATES.

BATTLESHIP.

Arkansas.

(As reconstructed 1927.)



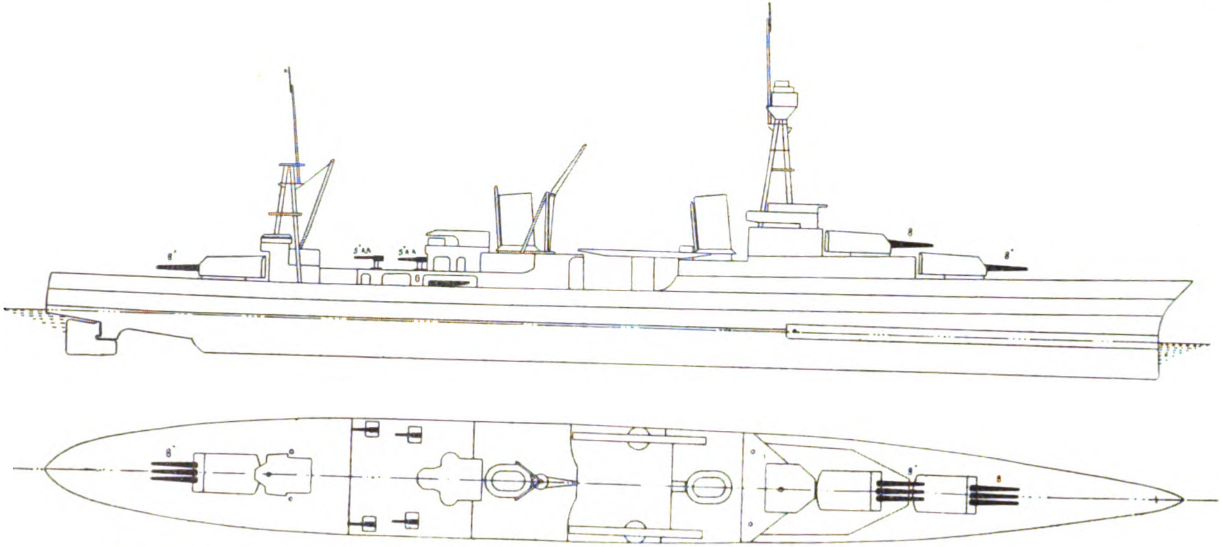
Length (extreme), 562 ft. ; Length, W.L., 555 ft. ; Speed, 20·5 knots ; 26,100 tons ; Completed, 1912. Armament, 12—12-in. ; 16—5-in. ; 8—3-in. A.A. ; 4—3-pr. ; 2—1-pr. ; 2 M. ; 1 catapult ; 3 aircraft.

Wyoming, a sister ship, has been demilitarised and converted to a **training ship.**

UNITED STATES.

CRUISERS.

Northampton **Chester.** **Louisville.** (*"Chester" Class.*) **Chicago.** **Houston.** **Augusta.** (*"Augusta" Class.*)



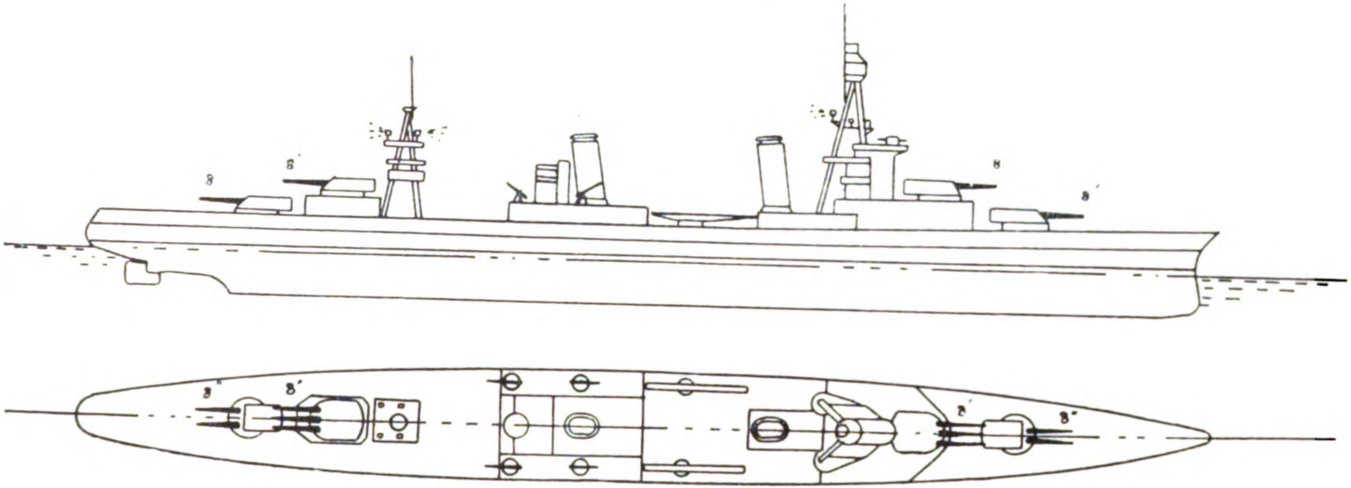
"Chester" and "Augusta" Classes: Length (extreme), 600 ft.; 9,050–9,300 tons; Speed, 32·5 knots; Completed, 1930–31. Armament, 9—8-in.; 4—5-in. A.A.; 2—3-pr.; 2 triple 21-in. torpedo tubes; 2 catapults; 4–6 seaplanes.

UNITED STATES.

CRUISERS.

"Pensacola" *Class.*

Salt Lake City. **Pensacola.**



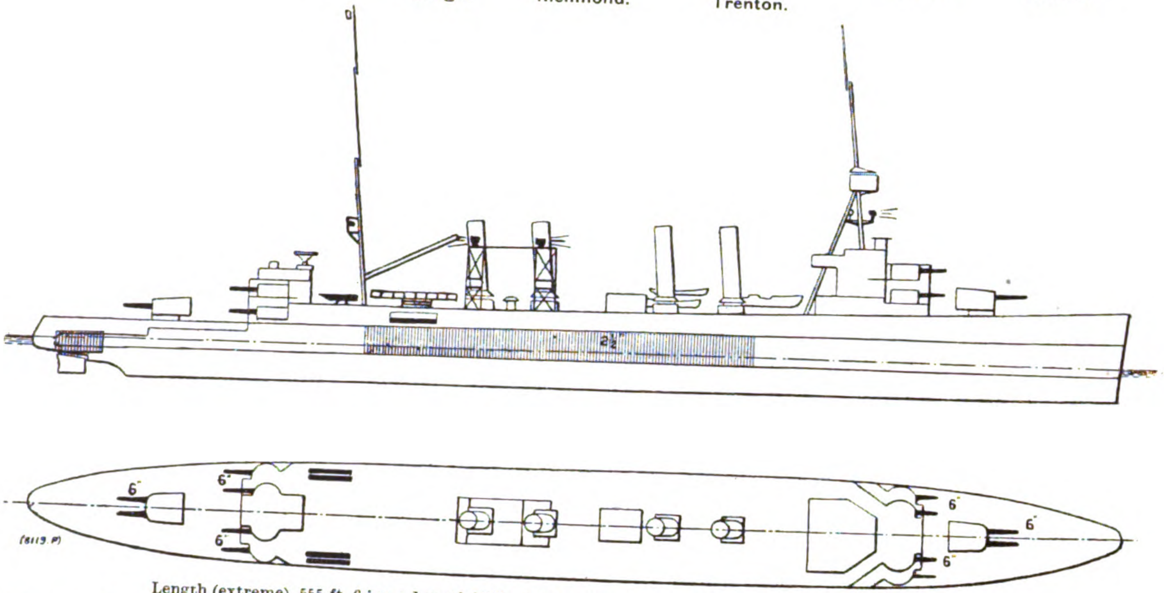
Length (extreme), 585½ ft. ; 9,100 tons ; Speed, 32½ knots ; Completed, 1930.
Armament, 10—8-in. ; 4—5-in. A.A. ; 2—3-pr. ; 2 triple 21-in. torpedo tubes.
2 catapults ; 4 seaplanes.
Correction to plan.—Crane fitted on fore side of after funnel.

UNITED STATES.

SCOUT CRUISERS.

"Omaha" Class.

Cincinnati. **Concord.** **Detroit.** **Raleigh.** **Marblehead.** **Richmond.** **Memphis.** **Trenton.** **Milwaukee.** **Omaha.**



Length (extreme), 555 ft. 6 ins.; Length W.L., 550 ft.; Speed, 35 knots; 7,050 tons. Completed in 1923-25

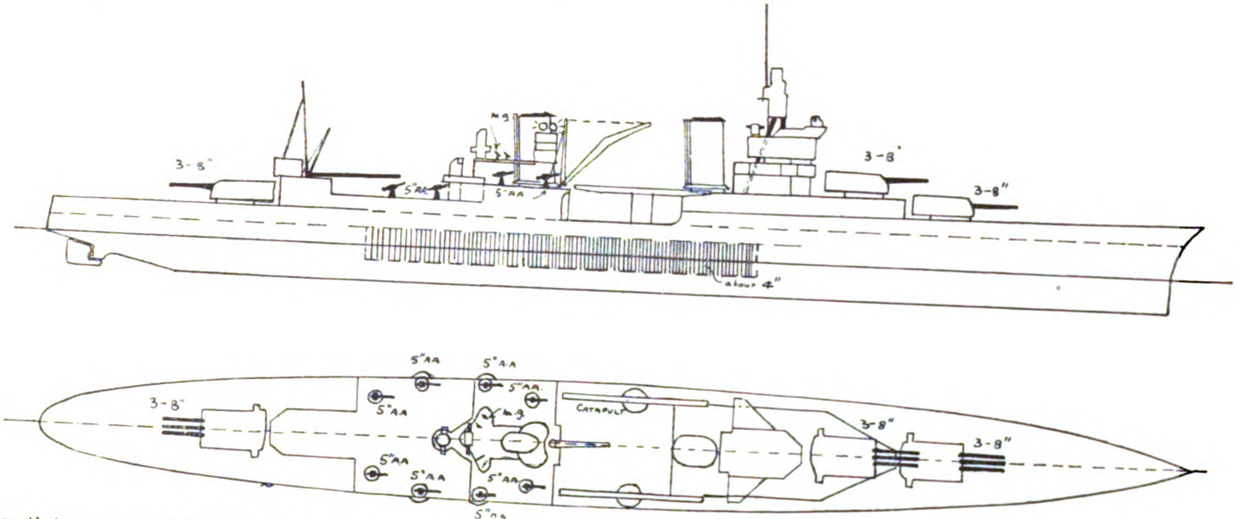
Armament, 12–6-in. (Marblehead, 11–6-in.; Cincinnati, Detroit, Raleigh and Richmond, 10–6-in.); 4–3-in. A.A.; 2–3-pr.; 2 triple above-water 21-in. torpedo tubes; 2 catapults; 2 aeroplanes.

Corrections to plan.—The pair of single 6-in. guns at upper deck level aft are removed in Marblehead, Cincinnati, Detroit, Raleigh and Richmond. In Marblehead there is a single gun on top of the after battery. Topmasts shortened.

UNITED STATES.

CRUISERS.

Indianapolis. Portland.



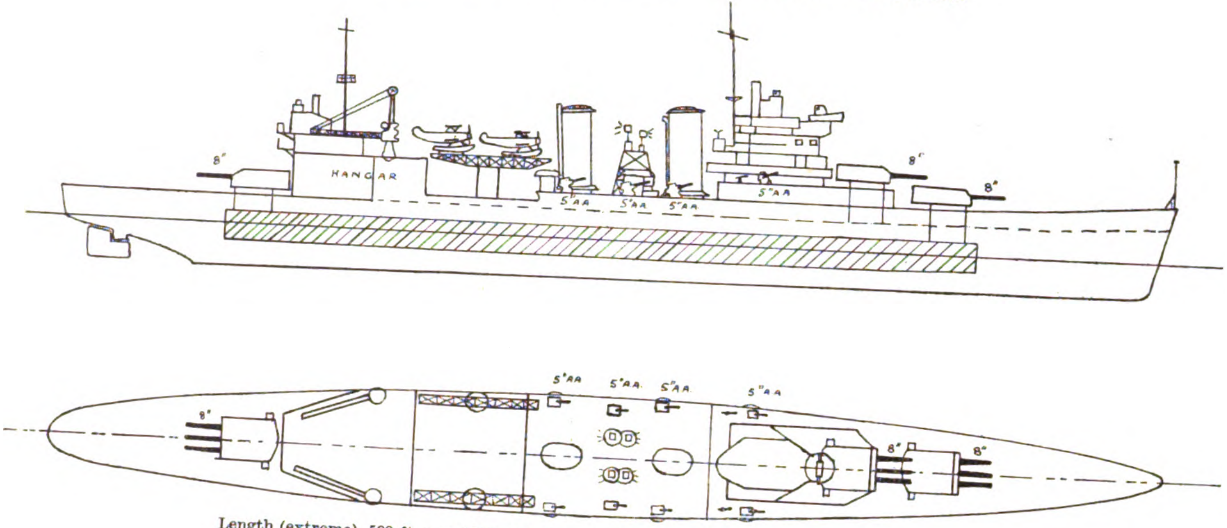
Length (extreme 610 ft. 3 ins.); Indianapolis, 584 ft. on W.L.; Portland, 582 ft. on W.L. Indianapolis, 9,950 tons; Portland. 9,800 tons. Speed, 32½ **knots.** Completed, 1932–1933. **Armament,** 9—8-in., 8—5-in. A.A.; 10 machine guns; 2 catapults; 4–6 aircraft; 2—3-pdr.
Correction to plan.—Fore topmast is raked.

UNITED STATES.

CRUISERS.

"Astoria" Class.

Astoria. New Orleans. San Francisco. Minneapolis. Tuscaloosa.

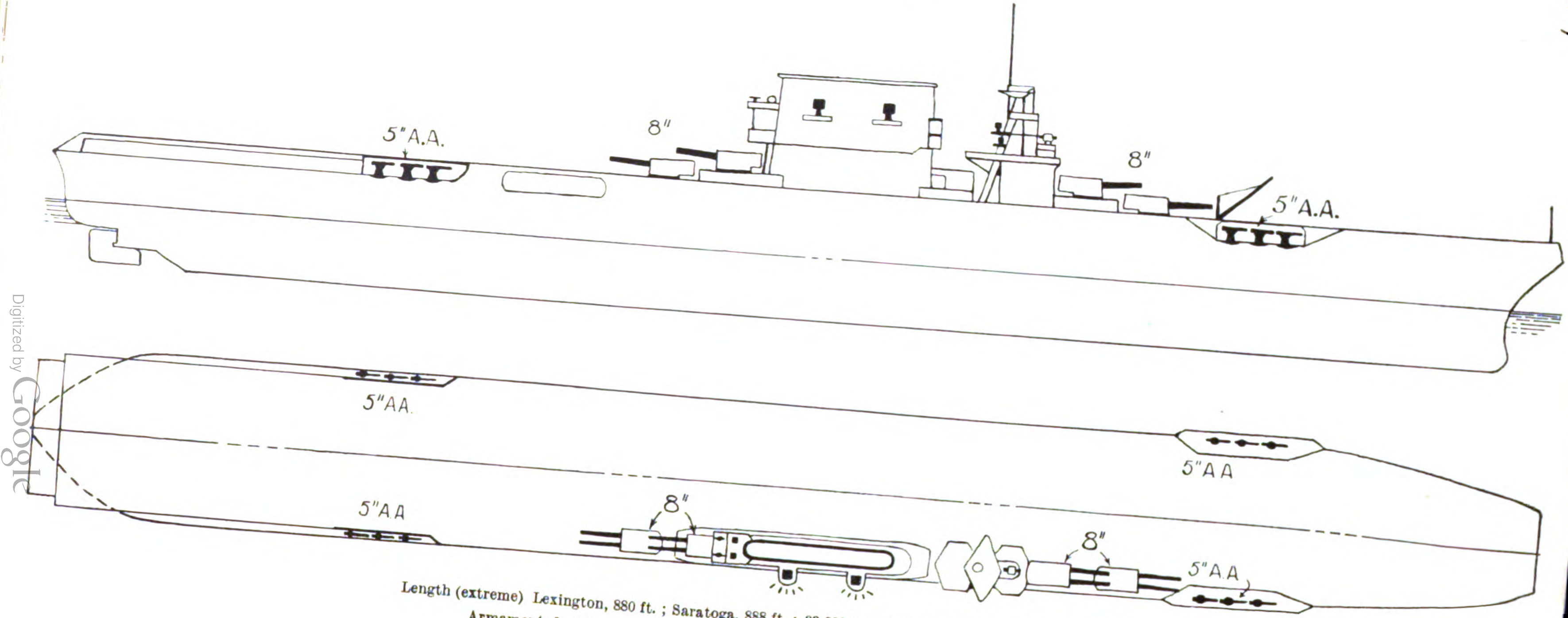


Length (extreme), 588 ft.; on W.L. 574 ft.; 10,000 tons (estd.). Speed, 32¾ knots. Completed, 1934.
Armament, 9—8-in., 8—5-in., 10 smaller; 2 catapults; 4–6 aircraft.

UNITED STATES.

AIRCRAFT CARRIERS.

Lexington. **Saratoga.**

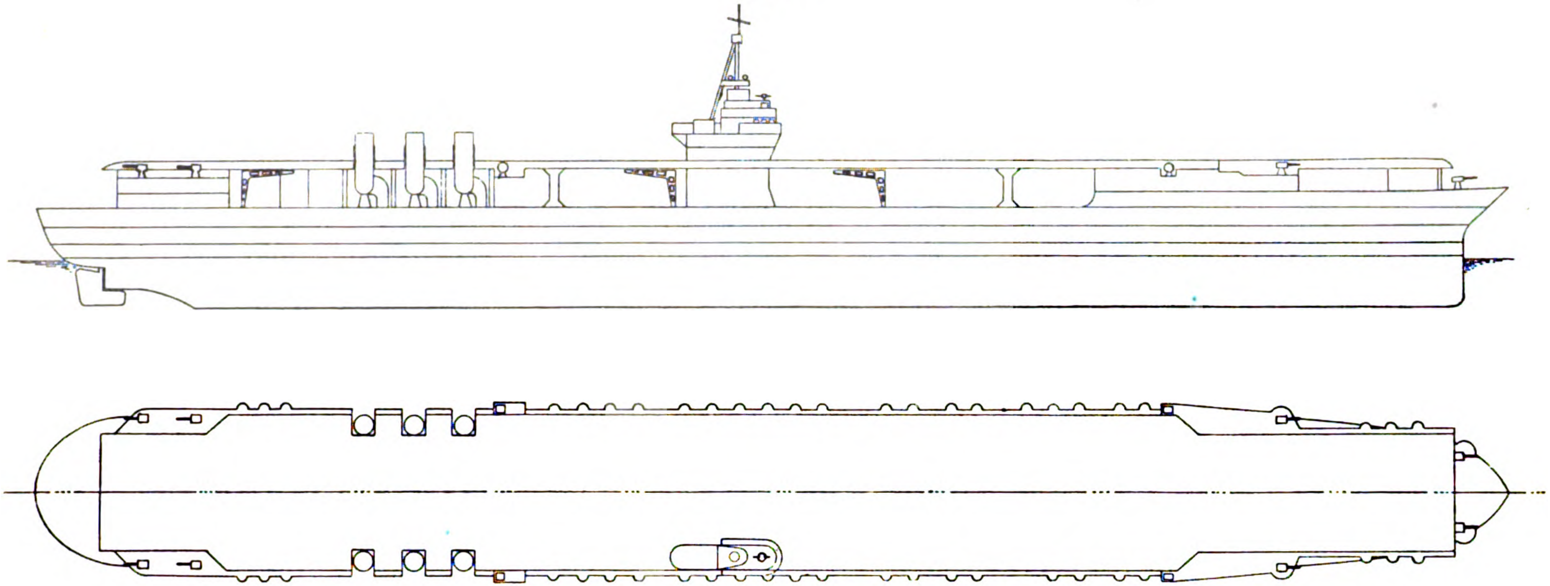


Length (extreme) Lexington, 880 ft. ; Saratoga, 888 ft. ; 33,000 tons ; Speed, 33¼ knots ; Completed, 1927.
Armament, 8—8-in. ; 12—5-in. A.A. ; 4—6-pr. ; Operate about 80 aircraft ; 1 catapult.

UNITED STATES.

AIRCRAFT CARRIER.

Ranger.



Length (overall), 769 ft.; Length (W.L.), 728 ft.; Displacement, 14,500 tons; Speed, 29¼ knots.

Armament, 8—5-in. A.A.; 76 aircraft.

NOTE.—The funnels can be swung outboard.

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METERS

FIRE CONTROL
GEAR

SUBMARINE PERISCOPES

TORPEDO DEPTH AND
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Communication material, 117
Coronation, the, 3–6
Cruisers, 27, 31, 34, 36–37, 39, 52–56, 65–67, 82–83, 218–219, 221–225, 234–235, 237, 240–241, 244–245, 249, 256–258, 302–303
—, lists of. See under different countries.
—, plans of:—
  Argentina, P54
  Australia, P50
  Finland, P56
  France, P61–P67
  Germany, P72–P74
  Great Britain, P39–P52
  Greece, P75
  Italy, P78–P85
  Japan, P91–P97
  Netherlands, P98–P99
  Norway, P100
  Soviet Union, P101
  Spain, P103–P105
  Sweden, P107
  United States, P115–P119
—, profiles of, P12–P22
Cuban Navy, 260
Czecho-Slovakian Navy, 260

D

Danish destroyers, P25
— Navy, 44, 231, 275
Defence, Statement relating to, 365–373
— White Paper, The, xi
Destroyers, 27–28, 31, 37, 40, 57–58, 67, 267–269, 274, 275–277, 280–282, 283–285, 287, 290–293
—, lists of. See under different countries.
—, profiles of:—
  Argentina, P24
  Chile, P25
  Colombia, P24
  Denmark, P25
  France, P23, P25
  Germany, P24
  Great Britain, P24–P25
  Greece, P25
  Italy, P23–P25
  Japan, P23–P25
  Netherlands, P24
  Poland, P23
  Portugal, P24
  Spain, P24
  Sweden, P25
  United States, P23, P25
  Yugoslavia, P23

E

Ecuadorian Navy, 260
Egyptian Navy, 260
Escort and patrol vessels, 67–68
Estimates, Naval, British, 390
—, —, French, 392
—, —, Italian, 393
—, —, Japanese, 393
—, —, United States, 392
Estonian Navy, 44, 260–261
Expansion of Naval Air Forces, 188–197

F

Finnish cruisers, P22, P56
— Navy, 261
Flag commands, 18
— signals, 107–108
Fleet Air Arms. See Air Arm.
— — — transfer, the, xv.
— aircraft, 57
— distribution of, xiv
Fleets, comparative strength of, 299–304
Foreign ports, visits to, 11–12
French aircraft, 162
— — carriers, 33, 233, P9, P68–P69
— battleships and battle-cruisers, 33, 232–233, P3, P5–P6, P57–P60
— cruisers, 34, 234–235, P15–P17, P19, P21, P61–P67
— destroyers, 276–277, P23, P25
— guns, 326
— Higher Command, 34–35
— naval air service, 312–313
— — estimates, 392
— Navy, 32–35, 232–235
— submarines, 277–278

G

German aircraft, 162–163
— — carriers, 36, 162
— battleships, 35–36, 236, P8, P70–P71
— cruisers, 36–37, 237, P17–P18, P21, P72–P74
— destroyers, 37, 279, P24
— guns, 327
— Navy, 35–38, 236–237
— — personnel, 38
— submarines, 37–38, 279
Greek cruisers, P20, P75
— destroyers, P25
— Navy, 44–45, 238, 280
Guns, naval, Beardmore, 324
—, —, Bofors, 334–336
—, —, Brazil, 325
—, —, French, 326
—, —, German, 327
—, —, Italian, 328
—, —, Japanese, 329
—, —, Netherlands, 330
—, —, Norwegian, 331–332
—, —, Spanish, 333
—, —, United States, 337
—, —, Vickers-Armstrongs, 317–323

H

Haytian Navy, 261
Holland. See *Netherlands*.
Hungarian Navy, 261

I

Iceland Navy, 261
Indian Navy, 22, 227

INDEX.

International situation, the, xvii
Introduction, ix–xvii
Iraq Navy, 261
Italian aerial co-operation, 84–85
— aircraft, 163
— battleships, 39, 80–82, 239, P5, P76–P77
— cruisers, 39, 82–83, 240–241, P12–P15, P17–P18, P78–P85
— destroyers, 40, 280–282, P23–P25
— guns, 328
— naval air service, 314
— — — work, 40–41, 84–85
— — estimates, 393
— — personnel, 85–86
— Navy, 38–41, 78–86, 239–241
— submarines, 40, 83–84, 282–283

J

Japanese aircraft, 161
— — carriers, 31, 161, 243, P10–P11, P90–P91
— battleships and battle-cruisers, 30–31, 242, P3–P4, P86–P89
— cruisers, 31, 244–245, P12–P15, P21–P22, P91–P97
— destroyers, 31, 283–285, P23–P25
— guns, 329
— naval air service, 311
— — estimates, 393
— Navy, 29–32, 242–245
— submarines, 31–32, 285

L

Latvian Navy, 261
Lesser classes, French Navy, 34
Limitation of Naval Armaments, Agreement for the, 348–364
Lower deck to quarter deck, 87–105

M

Manchukuo Navy, 261–262
Mate system, end of the, 101
— scheme, revised, 97–98
— —, the, 90–92
— (E.) scheme, the, 93
Men of the Merchant Navy, 119–134
Merchant seamen, 123, 132–134
— ships, employment of, 122
— vessels and fishing craft, 1914–18, 120
Mexican Navy, 262
Military aircraft constructors, 400
Ministry of Shipping, 124–125, 127–128

N

Naval air branch, xvi
— aircraft production, 166–172
— air forces, expansion of, 188–197
— Attaches, 396–397
— Estimates— :
  British, 390
  French, 392
  Italian, 393
  Japanese, 393
  United States, 392
Naval events of 1937, 3–23
— exercises, 15–16, 17
— officials, British and foreign, 394–395
— ordnance tables, 315–328
— personnel, 120–122
— signalling, 106–118
— strength, comparative, 299–304
— treaties, 6–8
Navy, Albanian, 259
—, Argentine, 47, 228, 274
—, Australian, 21–22, 94–95, 226
—, Austrian, 259
—, Brazilian, 48, 229, 274
—, British, 1–21, 218–225
—, Bulgarian, 259
—, Canadian, 22, 227
—, Chilean, 48, 230, 275
—, Chinese, 48–49, 259–260
—, Colombian, 260
—, Cuban, 260
—, Czecho-Slovakian, 260
—, Danish, 44, 231, 275
—, Ecuadorian, 260
—, Egyptian, 260
—, Estimates, the, xiii–xiv
— — 1938, Statement to accompany, 374
—, Estonian, 44, 260–261
—, Finnish, 261
—, French, 32–35, 232–235
—, German, 35–38, 236–237
—, Greek, 44–45, 238, 280
—, Haytian, 261
—, Hungarian, 261
—, Iceland, 261
—, Indian, 22, 227
—, Iraq, 261
—, Italian, 38–41, 78–86, 239–241
—, Japanese, 29–32, 242–245
—, Latvian, 261
—, Manchukuo, 261–262
—, Mexican, 262
—, Netherlands, 45–46, 246, 286
—, New Zealand, 22–23, 227
—, Norwegian, 247, 287
—, Paraguayan, 262
—, Persian, 262
—, Peruvian, 262–263
—, Polish, 46, 263
—, Portuguese, 263–264
—, Rumanian, 264
—, Siamese, 49, 264
—, South African, 227
—, Soviet Union, 41–43, 248–249
—, Spanish, 43–44, 250, 288
—, Swedish, 46, 251, 289
—, Turkish, 46, 265
—, United States, 25–29, 252–258
—, Uruguyan, 48, 265
—, Venezuelan, 48, 265
—, Yugoslavian, 46–47, 265–266
— Scheme, Australian, 94–95
Netherlands cruisers, P18, P21, P98–P99
— destroyers, P24
— guns, 330
— Navy, 45–46, 246, 286
Neutrality or Non-intervention, 69–77
New Zealand Navy, 22–23, 227

INDEX TO PROFILES OF WARSHIPS.

D

Danae, *cr.* G.B., P19
Dao, *d.* Port., P24
Dardo, *d.* I., P25
Dauntless, *cr.* G.B., P19
Davis, *d.* U.S.A., P23
Defender, *d.* G.B., P24
Delhi, *cr.* G.B., P19
De Ruyter, *cr.* D. P21
De Ruyter, *d.* H., P24
Despatch, *cr.* G.B., P19
Detroit, *s. cr.* U.S.A., P12
Deutschland, *a.s.* Ger., P8
Devonshire, *cr.* G.B., P13
Diderot, *b.* F., P3
Diomede, *cr.* G.B., P19
D. Manin, *d.* I., P25
Dorsetshire, *cr.* G.B., P13
Douglas, *f.l.* G.B., P24
Downes, *d.* U.S.A., P23
Dragen, *f.cl.t.b.* De., P25
Dragon, *cr.* G.B., P19
Drottning Victoria, *c.d.* Sw., P20
Dubrovnik, *f.l.* Y.S., P23
Duguay-Trouin, *cr.* F., P19
Duncan, *d.* U.S.A., P23
Duncan, *f.l.* G.B., P24
Dunedin, *cr.* G.B., P19
Dunkerque, *b.* F., P6
Dupleix, *cr.* F., P15
Duquesne, *cr.* F., P15
Durban, *cr.* G.B., P19

E

Eagle, *air.c.* G.B., P9
E. Cosenz, *d.* I., P23
Effingham, *cr.* G.B., P15
Ehrensköld, *d.* Sw., P25
Emden, *l.cr.* Ger., P18
Emerald, *cr.* G.B., P13
Emilé Bertin, *cr.m.l.* F., P17
Enseigne Gabolde, *d.* F., P23
Enseigne Roux, *d.* F., P23
Enterprise, *cr.* G.B., P13
Espero, *d.* I., P25
Ericsson, *d.* U.S.A., P23
Eugenio di Savoia, *cr.* I., P17
Euro, *d.* I., P25
Evertsen, *d.* H., P24
Exeter, *cr.* G.B., P16
Exmouth, *f.l.* G.B., P25

F

Falke, *d.* Ger., P24
Farragut, *d.* U.S.A., P25
Faulkner, *f.l.* G.B., P25
Filiberto Duca d'Aosta, *cr.* I., P17
Fiume, *cr.* I., P15
Foch, *cr.* F., P15
Folgore, *d.* I., P25
F. Stocco, *d.* I., P23
F. Crispi, *d.* I., P25
F. Nullo, *d.* I., P25
Freccia, *d.* I., P25
Frobisher, *cr.* G.B., P15
Fubuki, *d.* J. P23
Fulmine, *d.* I., P25
Furious, *air.c.* G.B., P10
Furutaka, *cr.* J., P15
Fuso, *b.* J., P4

G

Galatea, *cr.* G.B., P17
Gen. A. Cantore, *d.* I., P23
Gen. A. Cascino, *d.* I., P23
Gen. A. Chinotto, *d.* I., P23
Gen. C. Montanari, *d.* I., P23
Gen. A. Papa, *d.* I., P23
Gen. M. Prestinari, *d.* I., P23
Georges Leygues, *cr.* F. P16
G. Acerbi, *d.* I., P23
G. Carini, *d.* I., P23
G. Medici, *d.* I., P23
Giovanni della Bande Nere, *cr.* I., P17
Giulio Cesare, *b.* I., P5
G. la Farina, *d.* I., P23
G. la Masa, *d.* I., P23
G. Nicotera, *d.* I., P25
G. Sirtoti, *d.* I., P23
Glasgow, *cr.* G.B., P7
Glentin, *f.cl.t.b.* De., P25
Gloire, *cr.* F. P16
Glorious, *air. c.* G.B., P10
Gloucester, *cr.* G.B., P7
Gorizia, *cr.* I., P15
Gotland, *air.cr.* Sw., P9
Greif, *d.* Ger., P24
Greyhound, *d.* G.B., P24
Guépard, *f.l.* F., P23
Guglielmo Pepe, *d.* I., P25
Gustav V, *c.d.* Sw., P20

H

Haguro, *cr.* J., P14
Haruna, *b.* J., P4
Hawkins, *cr.* G.B., P15
Helle, *cr.* G., P20
Hermes, *air.c.* G.B., P9
Hero, *d.* G.B., P24
Hibiki, *d.* J., P25
Hirado, *cr.* J., P12
Hogen, *f.cl.t.b.* De., P25
Hood, *b.cr.* G.B., P3
Hosho, *air.c.* J., P10
Houston, *cr.* U.S.A., P16
Hova, *d.* F., P23
Hvalen, *f.cl.t.b.* De., P25
Hyatt, *d.* C., P25
Hydra, *d.* G., P25
Hyuga, *b.* J., P4

I

Idaho, *b.* U.S.A., P7
Ilmarinen, *a.s.* Fin., P22
Iltis, *d.* Ger., P24
Indianapolis, *cr.* U.S.A., P16
Intrepid, *d.* G.B., P24
Intrèpide, *d.* F., P25
Ise, *b.* J., P4
Isudzu, *l.cr.* J., P13

J

Jaguar, *f.l.* F., P23
Jaguar, *d.* Ger., P24
Jaime I, *b.* S., P8
Java, *cr.* D., P18
Jeanne d'Arc, *tr.cr.* F., P16
Jean-de-Vienne, *cr.* F. P16
Jintsu, *cr.* J., P12

K

Kabyle, *d.* F., P23
Kaga, *air.c.* J., P11
Kato, *cr.* J., P15
Karlsruhe, *l.cr.* Ger., P17
Kamikase, *f.cl.d.* J., P24
Kaya, *s.cl.d.* J., P25
Keith, *f.l.* G.B., P24
Kempenfelt, *f.l.* G.B., P24
Kent, *cr.* G.B., P13
Keppel, *f.l.* G.B., P24
Kersaint, *f.l.* F., P23
Kinu, *l.cr.* J., P13
Kinugasa, *cr.* J., P15
Kirishima, *b.* J., P4
Kiso, *l.cr.* J., P13
Kitakami, *l.cr.* J., P13
Klas Horn, *d.* Sw., P25
Klas Uggla, *d.* Sw., P25
Köln, *l.cr.* Ger., P17
Kondor, *d.* Ger., P24
Kongo, *b.* J., P4
Konigsberg, *l.cr.* Ger., P17
Kortenaer, *d.* H., P24
Krasni Kavkaz, *cr.* S.U., P20
Kuma, *l.cr.* J., P13
Kumano, *cr.* J. P21

L

La Galissonnière, *cr.* F. P16
La Motte Piquet, *cr.* F., P19
Lampo, *d.* I., P25
Langley, *air.c.*, U.S.A., P11
La Rioja, *f.l.* A., P24
Laxen, *f.cl.t.b.* De., P25
Leander, *cr.* G.B., P21
Le Chevalier-Paul, *f.l.* F., P23
Le Fantasque, *f.l.* F. P23
Leipzig, *l.cr.* Ger., P21
Leone, *f.l.* I., P24
Leopard, *d.* Ger., P24
Leopard, *f.l.* F., P23

INDEX TO PROFILES OF WARSHIPS.

Lexington, *air.c.* U.S.A., p10
Libertad, *cr.* S., p18
Lima, *d.* Port., p24
Lion, *f.l.* F., p23
Liverpool, *cr.* G.B., p7
London, *cr.* G.B., p13
Lorraine, *b.* F., p5
Louisville, *cr.* U.S.A., p16
Luchs, *d.* Ger., p24
Luigi Cadorna, *cr.* I., p18
Lynx, *f.l.* F., p23

M

Mackay, *f.l.* G.B., p24
Maillé Brézé, *f.l.* F., p23
Malaya, *b.* G.B., p6
Malcolm, *f.l.* G.B., p24
Manchester, *cr.* G.B., p7
Marat, *b.* S.U., p6
Marblehead, *s.cr.* U.S.A., p12
Marocain, *d.* F., p23
Marseillaise, *cr.* F. p16
Martino, *d.* I., p25
Maryland, *b.* U.S.A., p4
Maya, *cr.* J., p14
McDougal, *d.* U.S.A., p23
Mécanicien Principal Lestin, *d.* F., p23
Memphis, *s.cr.* U.S.A., p12
Mendez Nunez, *l.cr.* S., p14
Mendoza, *f.l.* A., p24
Miguel de Cervantes, *cr.* S., p18
Mikuma, *cr.* J., p21
Milwaukee, *s.cr.* U.S.A., p12
Minas Geraes, *b.* B., p6
Minekase, *f.cl.d.* J., p24
Minneapolis, *cr.* U.S.A., p15
Mississippi, *b.* U.S.A., p7
Mistral, *d.* F., p23
Mogami, *cr.* J. p21
Montcalm, *cr.* F. p16
Montecuccoli, *cr* I., p17
Montrose, *f.l.* G.B., p24
Moreno, *b.* A., p5
Möwe, *d.* Ger., p24
Mutsu, *b.* J., p3
Mutsuki, *f.cl.d.* J., p24
Muzio Attendolo, *cr.* I., p17
Myoko, *cr.* J., p14

N

Nachi, *cr.* J., p14
Nagara, *l.cr.* J., p13
Nagato, *b.* J., p3
Naka, *cr.* J., p12
Natori, *l.cr.* J., p13
Navigatori, *f.l.* I. p24
Nelson, *b.* G.B., p6
Nembo, *d.* I., p25
Neptune, *cr.* G.B., p21
Nevada, *b.* U.S.A., p8
Newcastle, *cr.* G.B., p7
New Orleans, *cr.* U.S.A., p15
New York, *b.* U.S.A., p7
N. Fabrizi, *d.* I., p23
Nicholson, *d.* U.S.A., p23
N. Sauro, *d.* I., p25
Nordenskjold, *d.* Sw. p25
Norfolk, *cr.* G.B., p13
Northampton, *cr.* U.S.A., p16

O

Ocean, *b.* F., p5
Oi, *l.cr.* J., p13
Oklahoma, *b.* U.S.A., p8
O'Brian, *d.* U.S.A., p23
Omaha, *s.cr.* U.S.A., p12
Opiniâtre, *d.* F., p23
Orage, *d.* F., p23
Orella, *d.* C., p25
Orion, *cr.* G.B., p21
Ornen, *f.cl.t.b.* De. p25
Oscar II, *b.* Sw., p3
Ostro, *d.* I., p25
Ouragan, *d.* F., p23

P

Palestro, *d.* I., p25
Pantera, *f.l.* I., p24
Panthère, *f.l.* F., p23
Paris, *b.* F., p5
Paris Commune, *b.* S.U., p6
Parker, *d.* U.S.A., p23
Penelope, *cr.* G.B., p17
Pennsylvania, *b.* U.S.A., p7
Pensacola, *cr.* U.S.A., p16
Piet Hein, *d.* H., p24
Pluton, *cr.m.l.* F., p19
Porter, *d.* U.S.A., p23
Portland, *cr.* U.S.A., p16
Pola, *cr.* I., p15
Primauguet, *cr.* F., p19
Profintern, *cr.* S.U., p13
Provence, *b.* F., p5
Psara, *d.* G., p25

Q

Quarto, *s.cr.* I., p14
Queen Elizabeth, *b.* G.B., p7
Q. Sella, *d.* I., p25

R

Raleigh, *s.cr.* U.S.A., p12
Ramillies, *b.* G.B., p7
Ranger, *air.c.* U.S.A., p11
Republica, *l.cr.* S., p14
Repulse, *b.cr.* G.B., p3
Resolution, *b.* G.B., p7
Revenge, *b.* G.B., p7
Richmond, *s.cr.* U.S.A., p12
Riquelme, *d.* C., p25
Rivadavia, *b.* A., p5
Rodney, *b.* G.B., p6
Rowan, *d.* U.S.A., p23
Royal Oak, *b.* G.B., p7
Royal Sovereign, *b.* G.B., p7
Ryujo, *air.c.* J., p11

S

Saetta, *d.* I., p25
Sakalave, *d.* F., p23
Salt Lake City, *cr.* U.S.A., p16
Sampson, *d.* U.S.A., p23
San Francisco, *cr.* U.S.A., p15
San Giorgio, *a.cr.* I., p12
San Marco, *a.cr.* I., p12
San Solferino, *d.* I., p25
São Paulo, *b.* B., p6
Saratoga, *air.c.* U.S.A., p10
Seeadler, *d.* Ger., p24
Sendai, *cr.* J., p12
Sénégalais, *d.* F., p23
Serrano, *d.* C., p25
Shakespeare, *f.l.* G.B., p24
Shaw, *d.* U.S.A., p23
Sheffield, *cr.* G.B., p7
Shropshire, *cr.* G.B., p13
Simoun, *d.* F., p23
Sirocco, *d.* F., p23
Somali, *d.* F., p23
Southampton, *cr.* G.B., p7
Spenser, *f.l.* G.B., p24
Spetzai, *d.* G., p25
Strale, *d.* I., p25
Stuart, *f.l.* G.B., p24
Suffolk, *cr.* G.B., p13
Suffren, *cr.* F., p15
Sumatra, *cr.* D., p18
Sussex, *cr.* G.B., p13
Suzuya, *cr.* J. p21
Sverige, *c.d.* Sw., p20
Sydney, *cr.* C.A., p17

T

Takao, *cr.* J., p14
Tama, *l.cr.* J., p13
Taranto, *l.cr.* I., p12
Tartu, *f.l.* F., p 23
Tatsuta, *l.cr.* J., p14
Téméraire, *d.* F., p23
Tempête, *d.* F., p23
Tennessee, *b.* U.S.A., p4
Tenryu, *l.cr.* J., p14
Texas, *b.* U.S.A., p7
Tiger, *d.* Ger., p24
Tigre, *f.l.* I., p24
Tigre, *f.l.* F., p23
Tikuma, *cr.* J., p21
Tone, *cr.* J. p21
Tonkinois, *d.* F., p23
Tornado, *d.* F., p23
Touareg, *d.* F., p23
Tourville, *cr.* F., p15

INDEX TO PROFILES OF WARSHIPS.

Tramontane, *d.* F., p23
Trento, *cr.* I., p18
Trenton, *s.cr.* U.S.A., p12
Trieste, *cr.* I., p18
Trombe, *d.* F., p23
Tucuman, *f.l.* A., p24
Tucker, *d.* U.S.A., p23
Turbine, *d.* I., p25
Tuscaloosa, *cr.* U.S.A., p15
Typhon, *d.* F., p23

U

Ukraina, *cr.* S.U., p13

V

Valentine, *d.* G.B., p24
Valhalla, *d.* G.B., p24
Valiant, *b.* G.B., p7
Valkyrie, *d.* G.B., p24
Valmy, *f.l.* F., p23
Valorous, *d.* G.B., p24
Vampire, *d.* G.B., p24
Vainämöinen, *a.s.* Fin., p22
Vanessa, *d.* G.B., p24
Van Galen, *d.* H., p24
Vanity, *d.* G.B., p24
Van Nes, *d.* H., p24
Vanoc, *d.* G.B., p24
Vanquisher, *d.* G.B., p24
Vauban, *f.l.* F., p23
Vauquelin, *f.l.* F., p23
Vectis, *d.* G.B., p24
Vega, *d.* G.B., p24
Velox, *d.* G.B., p24
Vendetta, *d.* G.B., p24
Venetia, *d.* G.B., p24
Venturous, *d.* G.B., p24
Verdun, *d.* G.B., p24
Verdun, *f.l.* F., p23
Versatile, *d.* G.B., p24
Vesper, *d.* G.B., p24
Viceroy, *d.* G.B., p24
Videlia, *d.* C., p25
Vidette, *d.* G.B., p24
Vimiera, *d.* G.B., p24
Vimy, *d.* G.B., p24
V. Orsini, *d.* I., p23
Vindictive, *cr.* G.B., p15
Vinticinco de Maio, *cr.* A., p22
Violent, *d.* G.B., p24
Viscount, *d.* G.B., p24
Vivacious, *d.* G.B., p24
Vivien, *d.* G.B., p24
Voltaire, *b.* F., p3
Vortigern, *d.* G.B., p24
Vouga, *d.* Port., p24
Voyager, *d.* G.B., p24

W

Wadsworth, *d.* U.S.A., p23
Wainwright, *d.* U.S.A., p23
Wakatake, *s.cl.d.* J., p25
Wakeful, *d.* G.B., p24
Walker, *d.* G.B., p24
Wallace, *f.l.* G.B., p24
Walpole, *d.* G.B., p24
Walrus, *d.* G.B., p24
Warspite, *b.* G.B., p7
Warwick, *d.* G.B., p24
Watchman, *d.* G.B., p24
Waterhen, *d.* G.B., p24
Wessex, *d.* G.B., p24
Westcott, *d.* G.B., p24
Westminster, *d.* G.B., p24
West Virginia, *b.* U.S.A., p4
Whirlwind, *d.* G.B., p24
Whitehall, *d.* G.B., p24
Whitley, *d.* G.B., p24
Whitshed, *d.* G.B., p24
Wicher, *d.* P., p23
Wildswan, *d.* G.B., p24
Wilkes, *d.* U.S.A., p23
Winchelsea, *d.* G.B., p24
Winchester, *d.* G.B., p24
Winslow, *d.* U.S.A., p23
Wishart, *d.* G.B., p24
Witch, *d.* G.B., p24
Witherington, *d.* G.B., p24
Witte de With, *d.* H., p24
Wivern, *d.* G.B., p24
Wolf, *d.* Ger., p24
Wolfhound, *d.* G.B., p24
Wolsey, *d.* G.B., p24
Wolverine, *d.* G.B., p24
Woolston, *d.* G.B., p24
Worcester, *d.* G.B., p24
Wrestler, *d.* G.B., p24
Wryneck, *d.* G.B., p24

Y

Yahagi, *cr.* J., p12
Yamashiro, *b.* J., p4
Yavouz Sultan Selim, *b.cr.* T., p6
York, *cr.* G.B., p16
Yubari, *l.cr.* J., p22
Yura, *l.cr.* J., p13

Z

Zara, *cr.* I., p15
Zeffiro, *d.* I., p25

INDEX TO PLANS OF WARSHIPS.

(Pages P27 to P112.)

A. = Argentine; B. = Brazil; C. = Chile; C.A. = Commonwealth of Australia; D. = Netherlands; F. = France; Fin. = Finland; G.B. = Great Britain; G. = Greece; Ger. = Germany; I. = Italy; J. = Japan; N. = Norway; R.A.N. = Royal Australian Navy; S. = Spain; Sw. = Sweden; U.S.A. = United States of America.

b. battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *a.s.* armoured ships; *a.t.* aviation transport; *air.c.* aircraft carrier; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser mine layer; *sea-p.c.* seaplane carrier; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *d.* destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship; *m.l.& t.s.*=mine layer and training ship; *air. cr.*=aircraft cruiser.

A

Abukuma, *l.cr.* J., P97
Achilles, *cr.* G.B., P40
Adelaide, *cr.* R.A.N., P50
Admiral Graf Spee, *a.s.* Ger., P70
Admiral Scheer, *a.s.* Ger., P70
Adventure, *cr.m.l.* G.B., P49
Akagi, *air.c.* J., P90
Albatross, *sea.p.c.* R.A.N., P49
Alberico di Barbiano, *cr.* I., P84
Alberto di Guissano, *cr.* I., P84
Algérie, *cr.* F., P62
Almirante Brown, *cr.* A., P54
Almirante Cervera, *cr.* S., P104
Almirante Latorre, *b.* C., P55
Amphion, *cr.* G.B., P47
Andrea Doria, *b.* I., P76
Aoba, *cr.* J., P94
Apollo, *cr.* G.B., P47
Arizona, *b.* U.S.A., P112
Arkansas, *b.* U.S.A., P114
Armando Diaz, *cr.* I., P84
Arethusa, *cr.* G.B., P48
Ashigara, *cr.* J., P92
Astoria, *cr.* U.S.A., P119
Atago, *cr.* J., P92
Augusta, *cr.* U.S.A., P115
Aurora, *cr.* G.B., P48
Australia, *cr.* R.A.N., P42

B

Baleares, *cr.* S. P103
Barham, *b.* G.B., P31
Bartolomeo Colleoni, *cr.* I., P84
Béarn, *air.c.* F., P68
Berwick, *cr.* G.B., P42
Birmingham, *cr.* G.B., P46
Bolzano, *cr.* I., P79
Bretagne, *b.* F., P58
Brindisi, *l.cr.* I., P85

C

Caio Duilio, *b.* I., P76
Cairo, *cr.* G.B., P51
Calcutta, *cr.* G.B., P51
Caledon, *cr.* G.B., P52
California, *b.* U.S.A., P109
Calypso, *cr.* G.B., P52
Canarias, *cr.* S. P103
Canberra, *cr.* R.A.N., P42
Cape Town, *cr.* G.B., P51
Caradoc, *cr.* G.B., P52
Cardiff, *cr.* G.B., P51
Carlisle, *cr.* G.B., P51
Ceres, *cr.* G.B., P51
Chervonnaya, *cr.* S.U., P101
Chester, *cr.* U.S.A., P115
Chicago, *cr.* U.S.A., P115
Chokai, *cr.* J., P92
Cincinnati, *s.cr.* U.S.A., P117
Clav Trygvason, *m.l.& t.s.* N., P100
Colbert, *cr.* F., P61
Colombo, *cr.* G.B., P51
Colorado, *b.* U.S.A., P108
Commandant Teste, *a.t.* F., P69
Concord, *s.cr.* U.S.A., P117
Condorcet, *b.* F., P60
Conte di Cavour, *b.* I., P77
Cornwall, *cr.* G.B., P43
Courageous, *air.c.* G.B., P35
Courbet, *b.* F., P59
Coventry, *cr.* G.B., P52
Cumberland, *cr.* G.B., P43
Curacoa, *cr.* G.B., P51
Curlew, *cr.* G.B., P52

D

Danae, *cr.* D. cl. G.B., P50
Dauntless, *cr.* D. cl. G.B., P50
Delhi, *cr.* D. cl. G.B., P50
De Ruyter, *cr.* D. P99
Despatch, *cr.* D. cl. G.B., P50
Detroit, *s.cr.* U.S.A., P117
Deutschland, *a.s.* Ger., P71
Devonshire, *cr.* G.B., P39
Diderot, *b.* F., P60
Diomede, *cr.* D. cl. G.B., P50
Dorsetshire, *cr.* G.B., P39
Dragon, *cr.* D. cl. G.B., P50
Drottning Victoria, *c.d.* Sw., P107
Duguay-Trouin, *cr.* F., P 64
Dunedin, *cr.* D. cl. G.B., P50
Dunkerque, *b.* F., P57
Dupleix, *cr.* F., P61
Duquesne, *cr.* F., P61
Durban, *cr.* D. cl. G.B., P50

E

Eagle, *air.c.* G.B., P37
Effingham, *cr.* G.B., P45
Eidsvold, *c.d.* N., P100
Emden, *l.cr.* Ger., P74
Emerald, *cr.* G.B., P44
Emilé Bertin, *cr.m.l.* F., P67
Enterprise, *cr.* G.B., P44
Eugenio di Savoia, *cr.* I., P82
Exeter, *cr.* G.B., P41

F

Filiberto Duca d'Aosta, *cr.* I., P82
Fiume, *cr.* I., P80
Foch, *cr.* F., P61
Frobisher, *cr.* G.B., P45
Furious, *air.c.* G.B., P36
Furutaka, *cr.* J., P95
Fuzo, *b.* J., P88

G

Galatea, *cr.* G.B., P48
Georges Leygues, *cr.* F. P63
Giorgios Averoff, *a.cr.* G., P75
Giovanni della Bande Nere, *cr.* I., P84
Giulio Cesare, *b.* I., P77
Glasgow, *cr.* G.B., P46
Gloire, *cr.* F. P63

INDEX TO PLANS OF WARSHIPS.

Gloucester, *cr.* G.B., p46
Glorious, *air.c.* G.B., p35
Gorizia, *cr.* I., p80
Gotland, *air.cr.* Sw., p106
Gustav V, *c.d.* Sw., p107

H

Haguro, *cr.* J., p92
Haruna, *b.* J., p89
Hawkins, *cr.* G.B., p45
Helle, *cr.* G., p75
Hermes, *air.c.* G.B., p38
Hertog Hendrik, *c.d.* D., p98
Hood, *b.cr.* G.B., p33
Hosho, *air.c.* J., p91
Houston, *cr.* U.S.A., p115
Hyuga, *b.* J., p87

I

Idaho, *b.*U.S.A., p110
Ilmarinen, *a.s.* Fin., p56
Indianapolis, *cr.* U.S.A., p118
Ise, *b.* J., p87
Isudzu, *l.cr.* J., p97

J

Jaime I, *b.* S., p102
Java, *cr.* D., p98
Jeanne d'Arc, *tr.cr.* F., p65
Jean-de-Vienne, *cr.* F. p63
Jintsu, *l.cr.* J., p96

K

Kako, *cr.* J., p95
Karlsruhe, *l.cr.* Ger., p72
Kent, *cr.* G.B., p42
Kinu, *l.cr.* J., p97
Kinugasa, *cr.* J., p94
Kirishima, *b.* J., p89
Kiso, *l.cr.* J., p97
Kitakami, *l.cr.* J., p97
Köln, *l.cr.* Ger., p72
Kongo, *b.* J., p89
Königsberg, *l.cr.* Ger., p72
Kuma, *l.cr.* J., p97
Kumano, *cr.* J. p93

L

La Galissonnière, *cr.* F. p63
La Motte Piquet, *cr.* F., p64
Leander, *cr.* G.B., p40
Leipzig, *l.cr.* Ger., p73
Lexington, *air.c.* U.S.A., p120
Libertad, *cr.* S., p104
Liverpool, *cr.* G.B., p46
London, *cr.* G.B., p39
Lorraine, *b.* F., p58
Louisville, *cr.* U.S.A., p115
Luigi Cadorna, *cr.* I., p84

M

25 Maio, *cr.* A., p54
Malaya, *b.* G.B., p31
Manchester, *cr.* G.B., p46
Marblehead, *s.cr.* U.S.A., p117
Marseillaise, *cr.* F. p63
Maryland, *b.* U.S.A., p108
Maya, *cr.* J., p92
Memphis, *s.cr.* U.S.A., p117
Mendez Nuñez, *l.cr.* S., p105
Miguel de Cervantes, *cr.* S., p104
Mikuma, *cr.* J. p93
Milwaukee, *s.cr.* U.S.A., p117
Minas Geraes, *b.* B., p56
Minneapolis, *cr.* U.S.A., p119
Mississippi, *b.* U.S.A., p110
Mogami, *cr.* J. p93
Montcalm, *cr.* F. p63
Montecuccoli, *cr.* I., p83
Moreno, *b.* A., p53
Mutsu, *b.* J., p86
Muzio Attendolo, *cr.* I., p83
Myoko, *cr.* J., p92

N

Nachi, *cr.* J., p92
Nagara, *l.cr.* J., p97
Nagato, *b.* J., p86
Naka, *l.cr.* J., p96
Natori, *l.cr.* J., p97
Nelson, *b.* G.B., p29
Neptune, *cr.* G.B., p40
Nevada, *b.* U.S.A., p111
Newcastle. *cr.* G.B., p46
New Mexico, *b.* U.S.A., p110
New Orleans, *cr.* U.S.A., p119
New York, *b.* U.S.A., p113
Norfolk, *cr.* G.B., p39
Norge, *c.d.* N., p100
Northampton, *cr.* U.S.A., p115

O

Ocean, *b.* F., p59
Oi, *l.cr.* J., p97
Oklahoma, *b.* U.S.A., p111
Omaha, *s.cr.* U.S.A., p117
Orion, *cr.* G.B., p40
Oscar II., *b.* Sw., p106

P

Paris, *b.* F., p59
Penelope, *cr.* G.B., p48
Pennsylvania, *b.* U.S.A., p112
Pensacola, *cr.* U.S.A., p116
Pluton, *cr.m.l.* F., p66
Pola, *cr.* I., p80
Portland, *cr.* U.S.A., p118
Primauguet, *cr.* F., p64
Profintern, *cr.* SU., p101
Provence, *b.* F., p58

Q

Quarto, *l.cr.* I., p85
Queen Elizabeth, *b.* G.B., p32

R

Raleigh, *s.cr.* U.S.A., p117
Ramillies, *b.* G.B., p30
Ranger, *air.c.* U.S.A., p121
Renown, *b.cr.* G.B., p34
Republica, *l.cr.* S., p105
Repulse, *b.cr.* G.B., p34
Resolution, *b.* G.B., p30
Revenge, *b.* G.B., p30
Richmond, *s.cr.* U.S.A., p117
Rivadavia, *b.* A., p53
Rodney, *b.* G.B., p29
Royal Oak, *b.* G.B., p30
Royal Sovereign, *b.* G.B., p30

S

Salt Lake City, *cr.* U.S.A., p116
San Francisco, *cr.* U.S.A., p119
São Paulo, *b.* B., p56
Saratoga, *air.c.* U.S.A., p120
S. Giorgio, *a.cr.* I., p78
S. Marco, *a.cr.* I., p78
Sendai, *l.cr.* J., p96
Sheffield, *cr.* G.B., p46
Shropshire, *cr.* G.B., p39
Southampton, *cr.* G.B., p46
Suffolk, *cr.* G.B., p43
Suffren, *cr.* F., p61
Sumatra, *cr.* D., p98
Sussex, *cr.* G.B., p39
Suzuya, *cr.* J. p93
Sverige, *c.d.* Sw., p107
Sydney, *cr.* R.A.N., p47

T

Takao, *cr.* J., p92
Tama, *l.cr.* J., p97
Tatsuta, *l.cr.* J., p97
Tennessee, *b.* U.S.A., p109
Tenryu, *l.cr.* J., p97
Texas, *b.* U.S.A., p113
Thionville, *l.cr.* F., p66
Tone, *cr.* J. p93
Tourville, *cr.* F., p61
Trento, *cr.* I., p81

INDEX TO PLANS OF WARSHIPS.

Trenton, *s.cr.* U.S.A., P117
Trieste, *cr.* I., P81
Tuscaloosa, *cr.* U.S.A., P119

U

Ukraina, *cr.* S.U., P101

V

Väinämöinen, *a.s.* Fin., P56
Valiant, *b.* G.B., P32
Venezia, *l.cr.* I., P85
Vindictive, *cr.* G.B., P45
Voltaire, *b.* F., P60

W

Warspite, *b.* G.B., P32
West Virginia, *b.* U.S.A., P108

Y

Yamashiro, *b.* J., P88
York, *cr.* G.B., P41
Yubari, *l.cr.* J., P91
Yura, *l.cr.* J., P97

Z

Zara, *cr.* I., P80

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